

=> fil reg
FILE 'REGISTRY' ENTERED AT 20:23:25 ON 24 MAY 2009
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STRUCTURE FILE UPDATES: 22 MAY 2009 HIGHEST RN 1148179-26-3
DICTIONARY FILE UPDATES: 22 MAY 2009 HIGHEST RN 1148179-26-3

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ISCA INFORMATION NOW CURRENT THROUGH January 9, 2009.

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REGISTRY includes numerically searchable data for experimental and
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experimental property data in the original document. For information
on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

=> d que stat 15
L3 STR



VAR G1=C/SI/N/P/O/S
NODE ATTRIBUTES:
NSPEC IS RC AT 1
NSPEC IS RC AT 5
NSPEC IS RC AT 6
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE
L5 15006 SEA FILE=REGISTRY SSS FUL L3

100.0% PROCESSED 23776 ITERATIONS
SEARCH TIME: 00.00.01

15006 ANSWERS

=> d que stat 113
L13 STR



VAR G1=C/SI/N/P/O/S

NODE ATTRIBUTES:

NSPEC IS RC AT 5

NSPEC IS RC AT 6

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE

=> d que stat l14

L14 STR



VAR G1=C/SI/N/P/O/S

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NSPEC IS RC AT 6

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

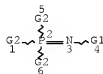
RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE

=> d que stat l15

L15 STR



Ak @11

Cy @12



VAR G1=C/SI/N/P/O/S

VAR G2=7/9/11/12/N/S/13

NODE ATTRIBUTES:

May 24, 2009

10/540,558

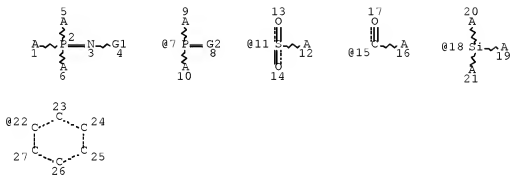
3

CONNECT IS E1 RC AT 11
DEFAULT MLEVEL IS ATOM
GGCAT IS SAT AT 11
GGCAT IS UNS AT 12
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

=> d que stat 116
L16 STR



VAR G1=7/11/15/18/22
VAR G2=O/S/C/SI/N/P
NODE ATTRIBUTES:
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NSPEC IS RC AT 5
NSPEC IS RC AT 6
NSPEC IS RC AT 9
NSPEC IS RC AT 10
NSPEC IS RC AT 12
NSPEC IS RC AT 16
NSPEC IS RC AT 19
NSPEC IS RC AT 20
NSPEC IS RC AT 21
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 27

STEREO ATTRIBUTES: NONE

=> d his

(FILE 'HOME' ENTERED AT 19:45:30 ON 24 MAY 2009)

FILE 'HCAPLUS' ENTERED AT 19:45:41 ON 24 MAY 2009
E US20060046151/PN

L1 1 S E3

SEL RN

L2 FILE 'REGISTRY' ENTERED AT 19:45:57 ON 24 MAY 2009
8 S E1-8

L3 FILE 'LREGISTRY' ENTERED AT 19:46:30 ON 24 MAY 2009
STR

L4 FILE 'REGISTRY' ENTERED AT 19:47:55 ON 24 MAY 2009
50 S L3
L5 15006 S L3 FUL
SAV L5 WEI558/A
L6 4 S L2 AND L5
L7 10677 S L5 NOT M/ELS
L8 10422 S L7 NOT PMS/CI
L9 8848 S L8 NOT NC>1
L10 STR L3
L11 SCR 2040

L12 FILE 'REGISTRY' ENTERED AT 19:51:29 ON 24 MAY 2009
50 S L10 NOT L11
L13 STR L10
L14 STR L13

L15 FILE 'LREGISTRY' ENTERED AT 19:57:34 ON 24 MAY 2009
STR L3
L16 STR L3

L17 FILE 'REGISTRY' ENTERED AT 20:07:48 ON 24 MAY 2009
50 S L13 NOT L11 SSS SAM SUB=L5
L18 SCR 2040 OR 2043
L19 50 S L13 NOT L18 SSS SAM SUB=L5
L20 1653 S L13 NOT L18 SSS FUL SUB=L5
SAV WEI558S1/A L20
L21 3 S L2 AND L20
L22 1 S L6 NOT L21
L23 7 S L14 NOT L18 SSS SAM SUB=L5
L24 143 S L14 NOT L18 SSS FUL SUB=L5
SAV WEI558S2/A L24
L25 50 S L15 NOT L18 SSS SAM SUB=L5
L26 5190 S L15 NOT L18 SSS FUL SUB=L5
SAV L26 WEI558S3/A
L27 1 S L2 AND L26
L28 4891 S L26 NOT NC>1
L29 50 S L16 NOT L18 SSS SAM SUB=L5
L30 4586 S L16 NOT L18 SSS FUL SUB=L5
SAV L30 WEI558S4/A

L31 FILE 'HCAPLUS' ENTERED AT 20:17:25 ON 24 MAY 2009
QUE ELECTROLY?
L32 19 S L20(L)L31
L33 8 S L24(L)L31
L34 26 S L28(L)L31
L35 37 S L30(L)L31
L36 QUE BATTERY
L37 12 S L32 AND L36
L38 4 S L33 AND L36
L39 19 S L34 AND L36
L40 26 S L35 AND L36
L41 8 S L33 OR L38

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 20:23:46 ON 24 MAY 2009
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FILE COVERS 1907 - 24 May 2009 VOL 150 ISS 22
FILE LAST UPDATED: 22 May 2009 (20090522/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Feb 2009
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Feb 2009

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d ibib abs hitstr hitind l37 1-12

L37 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:1334246 HCAPLUS Full-text
DOCUMENT NUMBER: 147:544588
TITLE: Nonaqueous electrolyte containing phosphazene compound and lithium ion secondary battery with high discharge efficiency having the same
INVENTOR(S): Nakagawa, Hiroe; Katayama, Sadahiro; Nukuta, Toshiyuki
PATENT ASSIGNEE(S): GS Yuasa Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007305551	A	20071122	JP 2006-135814	20060515

OTHER SOURCE(S): MARPAT 147:544588

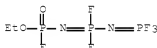
AB Disclosed is a nonaq. electrolyte made from an organic material consisting of a lithium salt, and a salt at molten state at room temperature containing a (cyclic) phosphazene compound and a quaternary ammonium organic cation.

IT 850650-07-6

RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte containing phosphazene compound for
lithium ion secondary battery with high discharge
efficiency)

RN 850650-07-6 HCAPLUS

CN Phosphoramidofluoridic acid,
N-[difluoro[(trifluorophosphoranylidene)amino]phosphoranylidene]-,
ethyl ester (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte cyclic phosphazene compd lithium ion secondary battery; quaternary ammonium org cation

IT Secondary batteries

(lithium; nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

IT Battery electrolytes

(nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

IT Quaternary ammonium compounds, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte containing phosphazene compound for lithium ion
secondary battery with high discharge efficiency)

IT 33027-66-6 90076-65-6, LiTFSi 132843-44-8, Lithium

bis(perfluoroethanesulfonyl)imide 143314-16-3,
1-Ethyl-3-methylimidazolium tetrafluoroborate 174501-64-5,
1-Butyl-3-methylimidazolium hexafluorophosphate 174501-65-6,
1-n-Butyl-3-methylimidazolium tetrafluoroborate 859650-07-6

RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte containing phosphazene compound for
lithium ion secondary battery with high discharge
efficiency)

L37 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:368511 HCAPLUS Full-text

DOCUMENT NUMBER: 142:433056

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Koto, Tomoko

PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkoku Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

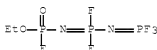
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005116306	A	20050428	JP 2003-348133	20031007
PRIORITY APPLN. INFO.:			JP 2003-348133	20031007

AB The battery has a cathode, containing a Li-Ni-Mn composite oxide : $\text{Li}_x\text{Ni}_y\text{Mn}_{2-y}\text{O}_{4-8}$ ($0 < x < 1.1$; $0.45 < y < 0.55$; and $0 \leq \delta < 0.4$) as a cathode active mass, an anode, and a nonaq. electrolyte solution; where the electrolyte solution contains 0.1-20 mass%. phosphazene derivative

IT 850650-07-6
RL: MOA (Modifier or additive use); USES (Uses)
(cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

RN 850650-07-6 HCAPLUS

CN Phosphoramidofluoridic acid,
N-[difluoro(trifluorophosphoranylidene)amino]phosphoranylidene]-, ethyl ester (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery cathode lithium manganese nickel oxide; battery electrolyte phosphazene deriv

IT Battery cathodes
Battery electrolytes
(cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT Polyphosphazenes
RL: MOA (Modifier or additive use); USES (Uses)
(cyclic; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT Secondary batteries
(lithium; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
7782-42-5, Graphite, uses 12031-75-3, Lithium manganese nickel oxide (LiMn_{1.5}Ni_{0.5}O₄) 14283-07-9, Lithium tetrafluoroborate

21324-40-3, Lithium hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and electrolytes
 containing phosphazene derivs. for secondary lithium
 batteries)

IT 850650-07-6

RL: MOA (Modifier or additive use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and
 electrolytes containing phosphazene derivs. for secondary
 lithium batteries)

L37 ANSWER 3 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:570217 HCAPLUS Full-text

DOCUMENT NUMBER: 141:126304

TITLE: Additive for secondary battery
 nonaqueous electrolyte solution and the
 battery

INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004059782	A1	20040715	WO 2003-JP16592	20031224
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2003292764	A1	20040722	AU 2003-292764	20031224
EP 1580832	A1	20050928	EP 2003-768180	20031224
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
CN 1732588	A	20060208	CN 2003-80107739	20031224
CN 100362689	C	20080116		
US 20060046151	A1	20060302	US 2005-540558	20050624

PRIORITY APPLN. INFO.:

JP 2002-377142

A

200212
26

WO 2003-JP16592

W

200312
24

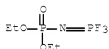
AB The additive comprises a phosphazene derivative represented by R13P = N-X (R1 = halo or monovalent substituent; and X = C, Si, N, P, O and/or S containing organic group). The battery has a nonaq. electrolyte solution comprising the above additive, a cathode, and an anode.

IT 722454-84-4 722454-85-5 722454-86-6

RL: MOA (Modifier or additive use); USES (Uses)
(additives containing phosphazene derivs. for secondary
battery electrolytes)

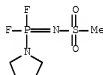
RN 722454-84-4 HCAPLUS

CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester
(9CI) (CA INDEX NAME)



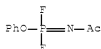
RN 722454-85-5 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-
(9CI) (CA INDEX NAME)



RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA
INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery nonaq electrolyte additive
phosphazene deriv

IT Battery electrolytes

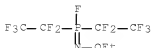
(additives containing phosphazene derivs. for secondary

battery electrolytes)
 IT Secondary batteries
 (lithium; additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium
 hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT 2397-48-0 722454-84-4 722454-85-5
 722454-86-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L37 ANSWER 4 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2004:139816 HCAPLUS Full-text
 DOCUMENT NUMBER: 140:184695
 TITLE: Secondary nonaqueous electrolyte battery
 INVENTOR(S): Narioka, Yoshinori; Mori, Sumio
 PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokyo Koho, 14 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004055208	A	20040219	JP 2002-208280	200207 17
PRIORITY APPLN. INFO.:			JP 2002-208280	200207 17

AB The battery has an active mass containing anode and a Li salt dissolved nonaq.
 electrolyte solution; where the electrolyte solution has a halo-containing
 phosphazene compound and the anode has a binder comprising a non-halo
 material.
 IT 657348-91-9
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. having halo-containing phosphazene
 comds. for secondary lithium batteries)
 RN 657348-91-9 HCAPLUS
 CN Phosphinimidic fluoride, N-ethoxy-P,P-bis(pentafluoroethyl)- (9CI)
 (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-62
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary battery electrolyte halo contg phosphazene
compd; anode binder nonhalo compd secondary battery
IT Fluoropolymers, uses
Styrene-butadiene rubber, uses
RL: DEV (Device component use); USES (Uses)
(anode binder; anode binders containing non-halo materials for
secondary lithium batteries)
IT Battery anodes
(anode binders containing non-halo materials for secondary lithium
batteries)
IT Battery electrolytes
(electrolyte solns. having halo-containing phosphazene compds. for
secondary lithium batteries)
IT Secondary batteries
(secondary lithium batteries having halo-containing
phosphazene compds. in electrolyte solns. and non-halo materials
in anodes)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(anode active mass; anode binders containing non-halo materials for
secondary lithium batteries)
IT 24937-79-9, PvdF
RL: DEV (Device component use); USES (Uses)
(anode binder; anode binders containing non-halo materials for
secondary lithium batteries)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
21324-40-3, Lithium hexafluorophosphate 657348-91-9
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. having halo-containing phosphazene
compds. for secondary lithium batteries)
IT 9003-55-8
RL: DEV (Device component use); USES (Uses)
(styrene-butadiene rubber, anode binder; anode binders containing
non-halo materials for secondary lithium batteries)

L37 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2001:873246 HCAPLUS [Full-text](#)
DOCUMENT NUMBER: 136:20156
TITLE: Preparation of sulfonyl-containing phosphazenes
INVENTOR(S): Narita, Yukio; Saito, Tadashi; Ohara, Nobuhiko;
Wakui, Atsushi; Kamata, Tomohisa
PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001335590	A	20011204	JP 2000-157053	200005 26

PRIORITY APPLN. INFO.:

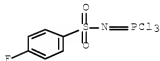
JP 2000-157053

200005

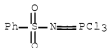
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OTHER SOURCE(S): CASREACT 136:20156; MARPAT 136:20156

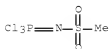
- AB The title (R1O)3P:NSO2R2 [R1 = (CH2CH2O)nMe which may be substituted with halo (n = 1-5); R2 = Cl-12 (halo)alkyl, (halo)phenyl, Cl-4 alkyl-(halo)phenyl] (I), useful as electrolytes for nonaq. secondary batteries, flame retardants for lubricants, etc., are prepared by treating phosphorus pentahalides with H2NSO2R2 (R2 = same as above) and then treating the resulting X3P:NSO2R2 (R2 = same as above; X = halo) (II) with R1OM (R1 = same as above; M = alkali metal). E.g., a mixture of PCl5, PhSO2NH2, toluene, and THF was stirred at room temperature for 2.5 h to give 96.9% II (R2 = Ph, X = Cl) (III). An alcoholate solution, prepared from MeOCH2CH2OH and NaH in THF, was added dropwise to a mixture of III and toluene at 0-10° and then the reaction mixture was stirred at room temperature for 3.5 h to give 78.4% I (R1 = CH2CH2OMe, R2 = Ph).
- IT 1525-81-1P, N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene 5666-55-7P, Trichlorophosphazosulfonylbenzene 29651-24-9P 377780-52-4P, N-2,4-Difluorobenzenesulfonyl-P,P,P-trichlorophosphazene
- RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation of phosphazosulfonyl compds. as electrolytes for nonaq. secondary batteries)
- RN 1525-81-1 HCAPLUS
- CN Benzenesulfonamide, 4-fluoro-N-(trichlorophosphoranylidene)- (CA INDEX NAME)



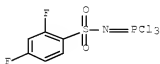
- RN 5666-55-7 HCAPLUS
- CN Benzenesulfonamide, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



- RN 29651-24-9 HCAPLUS
- CN Methanesulfonamide, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 377780-52-4 HCAPLUS
 CN Benzenesulfonamide, 2,4-difluoro-N-(trichlorophosphoranylidene)-
 (CA INDEX NAME)



- IC ICM C07F009-24
 ICS H01G009-038; H01G009-035; H01M006-16; H01M010-40
 CC 29-7 (Organometallic and Organometalloidal Compounds)
 Section cross-reference(s): 52
 ST methoxyethylphosphazosulfonylbenzene prepn electrolyte nonaq
 secondary battery; phosphazosulfonyl compd prepn
 electrolyte nonaq secondary battery; phosphorus
 pentahalide condensation sulfonamide; halophosphazosulfonyl compd
 condensation glycol ether alcoholate
 IT Battery electrolytes
 (preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
 secondary batteries)
 IT Phosphazenes
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)
 (preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
 secondary batteries)
 IT 111-77-3P, Diethylene glycol monomethyl ether 1525-81-1P,
 N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene
 5666-55-7P, Trichlorophosphazosulfonylbenzene 19278-10-5P,
 Diethylene glycol monomethyl ether sodium salt 29651-24-9P
 377780-52-4P, N-2,4-Difluorobenzenesulfonyl-P,P,P-
 trichlorophosphazene
 RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic
 preparation); PREP (Preparation); RACT (Reactant or reagent)
 (preparation of phosphazosulfonyl compds. as electrolytes
 for nonaq. secondary batteries)
 IT 377780-53-5P 377780-54-6P 377780-55-7P 377780-56-8P
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)
 (preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
 secondary batteries)
 IT 98-10-2, Benzenesulfonamide 109-86-4, Ethylene glycol monomethyl
 ether 402-46-0, 4-Fluorobenzenesulfonamide 3139-99-9, Ethylene
 glycol monomethyl ether sodium salt 3144-09-0, Methanesulfonamide
 10026-13-8, Phosphorus pentachloride 13656-60-5,
 2,4-Difluorobenzenesulfonamide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
 secondary batteries)

L37 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:369718 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 134:367047

TITLE: Preparation of sulfonyl-containing phosphazenes
 as flame retardants for battery
 electrolytes

May 24, 2009

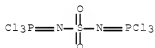
10/540,558

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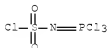
INVENTOR(S): Tsuchiya, Tsubasa; Kawakabe, Hiroshi; Wakui, Atsushi; Kamata, Tomohisa
 PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001139584	A	20010522	JP 1999-325440	19991116
PRIORITY APPLN. INFO.:			JP 1999-325440	19991116

OTHER SOURCE(S): CASREACT 134:367047; MARPAT 134:367047
 AB Title compds. (R1O)3P:NSO3R1 or (R2O)3P:NSO2N:P(OR2)3 [R1, R2 = (ether-containing) C1-10 alkyl, haloalkyl] are prepared by reaction of PX5 (X = halo) with sulfamic acid or sulfamide followed by ROM (R = same as R1 or R2; M = alkali metal). PC15 was treated with sulfamic acid in PhCl at 100-105° for 12 h to give 68.8% Cl3P:NSO2Cl, which was treated with diethylene glycol monomethyl ether alcoholate in THF at -22 to -20° for 1 day to give 75.2% (MeOC2H4OC2H4O)3P:NSO3C2H4OC2H4OMe.
 IT 14259-65-5P, Bis(trichlorophosphazo) sulfone
 14700-21-1P, Trichlorophosphazosulfonyl chloride
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
 RACT (Reactant or reagent)
 (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)
 RN 14259-65-5 HCAPLUS
 CN Sulfamide, N,N'-bis(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 14700-21-1 HCAPLUS
 CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



IC ICM C07F009-24
 ICS C09K021-12
 CC 29-7 (Organometallic and Organometalloidal Compounds)

- Section cross-reference(s): 52
- ST sulfonyl phosphazene prepn flame retardant electrolyte;
battery electrolyte flame retardant phosphazene prepn;
sulfamic acid reaction phosphorus pentahalide alcoholate; sulfamide
reaction phosphorus pentahalide alcoholate
- IT Battery electrolytes
Fireproofing agents
(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)
- IT Metal alkoxides
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)
- IT 109-86-4D, Ethylene glycol monomethyl ether, salts 111-77-3D,
Diethylene glycol monomethyl ether, salts 141-52-6, Sodium
ethoxide 5329-14-6, Sulfamic acid 7803-58-9, Sulfamide
10026-13-8, Phosphorus pentachloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)
- IT 14259-65-5P, Bis(trichlorophosphazeno) sulfone
14700-21-1P, Trichlorophosphazosulfonyl chloride
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)
- IT 72250-12-5P 271771-13-2P 271771-14-3P 271771-15-4P
RL: SPN (Synthetic preparation); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)

L37 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1998:686074 HCAPLUS Full-text

DOCUMENT NUMBER: 130:25419

TITLE: Polyphosphazenes with Novel Architectures:
Influence on Physical Properties and Behavior as
Solid Polymer Electrolytes

AUTHOR(S): Allcock, Harry R.; Sunderland, Nicolas J.;
Ravikiran, Ramakrishna; Nelson, James M.

CORPORATE SOURCE: Department of Chemistry, The Pennsylvania State
University, University Park, PA, 16802, USA

SOURCE: Macromolecules (1998), 31(23), 8026-8035
CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Three types of polyphosphazenes with different architectures have been
synthesized and characterized. The influence of the polymer architecture on
solid ionic conductivity was of particular interest. The first type includes
linear oligo- and polyphosphazenes with the general formula
[N:P(OCH₂CH₂OCH₂CH₂OCH₃)₂n] (MEEP) with different chain lengths. The second
type consists of a series of tri-armed star-branched polyphosphazenes with the
general formula N(CH₂CH₂NH(CF₃CH₂O) 2P[N:P(OCH₂CH₂OCH₂CH₂OCH₃)₂n]₃ with
different arm lengths. These were synthesized via the reaction of the
tridentate initiator [N(CH₂CH₂NH(CF₃CH₂O) 2P:N-PCl₃)]₃ [PCl₆]-j₃ with the
phosphoranimine Cl₃P:NSiMe₃ in CH₂Cl₂ followed by halogen replacement with
sodium (methoxyethoxy)ethoxide. The mol. wts. in this system were carefully
controlled by variation of the monomer-to-initiator ratios, and the effect of
polymer mol. weight on solid ionic conductivity was examined. The third

polymer system was designed to examine the effect of complex branching on ionic conductivity. Thus, a highly branched polymer containing five branches from a cyclotriphosphazene pendent side group (with 26 ethyleneoxy units per repeat unit) was synthesized. The conductivity of this polymer in the presence of three different salts has been measured and compared to the behavior of MEEP with a corresponding mol. weight. The mechanism of ion transport in these systems is discussed.

IT 40678-60-2DP, derivs., lithium complexes
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(linear and branched; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
RN 40678-60-2 HCAPLUS
CN Phosphorimidic trichloride, N-(trimethylsilyl)- (CA INDEX NAME)

Cl3P—N—SiMe3

CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 37, 52, 76
IT Battery electrolytes
Glass transition temperature
Ionic conductivity
Molecular weight
Polymer electrolytes
(preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
IT 19278-10-5DP, 2-(2-Methoxyethoxy)ethanol sodium salt, reaction products with poly(dichlorophosphazene), lithium complexes
26085-02-9DP, Poly(dichlorophosphazene), derivs., lithium complexes
40678-60-2DP, derivs., lithium complexes
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(linear and branched; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L37 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2009 ACS ON STN

ACCESSION NUMBER: 1998:681962 HCAPLUS Full-text

DOCUMENT NUMBER: 129:262843

ORIGINAL REFERENCE NO.: 129:53509a,53512a

TITLE: High conductivity electrolyte solutions and secondary batteries using the solutions

INVENTOR(S): Angell, Charles Austen; Zhang, Sheng-Shui; Xu, Kang

PATENT ASSIGNEE(S): Arizona Board of Regents, USA

SOURCE: U.S., 14 pp.
CODEN: USXXAM

DOCUMENT TYPE: Patent
LANGUAGE: English

May 24, 2009

10/540,558

17

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5824433	A	19981020	US 1996-748009	19961112
PRIORITY APPLN. INFO.:			US 1996-748009	19961112

OTHER SOURCE(S): MARPAT 129:262843

AB The electrolyte solns. contain an electrolyte solute and a sulfonyl/phospho compound solvent RSO₂X (X = halide and R = perfluoroalkyl group, perchlorinated group, N:PX₃) or X₃P:NR' [R' = P(O)X₂ or C1-6 alkyl group]. The solvent may contain C13PNSO₂Cl, C13PNP(O)Cl₂, C13PNCH₃, CL3PNCH₂CH₃, and/or CF₃(CF₂)₃SO₂F; and the electrolyte solute os LiAlCl₄ or (CF₃SO₂)₂NLi. The electrolyte may also contain a polymer.

IT 13966-08-0P 14700-21-1P 23453-30-7P

44584-14-7P

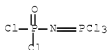
RL: DEV (Device component use); IMF (Industrial manufacture); PREP

(Preparation); USES (Uses)

(high conductivity electrolyte solns. containing sulfur-phosphorus compound electrolyte solvents for secondary batteries)

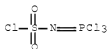
RN 13966-08-0 HCAPLUS

CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
(CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 23453-30-7 HCAPLUS

CN Phosphorimidic trichloride, methyl- (8CI, 9CI) (CA INDEX NAME)



RN 44584-14-7 HCAPLUS

CN Phosphorimidic trichloride, ethyl- (9CI) (CA INDEX NAME)

Cl3P=N-Et

IC ICM H01M006-14
 INCL 429194000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery electrolyte solvent; battery
 electrolyte solvent sulfur phosphorous compd
 IT Battery electrolytes
 (high conductivity electrolyte solns. containing sulfur-phosphorus compound
 electrolyte solvents for secondary lithium batteries
 and sodium/sulfur batteries)
 IT 124-63-0, Methanesulfonyl chloride 9011-14-7, Pmma 14024-11-4,
 Aluminum lithium chloride (LiAlCl4) 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (high conductivity electrolyte solns. containing sulfur-phosphorus compound
 electrolyte solvents for secondary batteries)
 IT 13966-08-0P 14700-21-1P 23453-30-7P
 44584-14-7P
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (high conductivity electrolyte solns. containing sulfur-phosphorus
 compound electrolyte solvents for secondary
 batteries)
 REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

L37 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 1997:443306 HCAPLUS Full-text
 DOCUMENT NUMBER: 127:53454
 ORIGINAL REFERENCE NO.: 127:10137a,10140a
 TITLE: Electrochemically stable electrolytes which do
 not crystallize at ambient temperature
 INVENTOR(S): Angell, Charles Austen; Zhang, Sheng Shui; Xu,
 Kang
 PATENT ASSIGNEE(S): Arizona Board of Regents, USA
 SOURCE: PCT Int. Appl., 31 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9718159	A1	19970522	WO 1996-US18325	19961113
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA,				

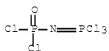
GN, ML, MR, NE, SN, TD, TG			
US 5855809	A	19990105	US 1996-748008
			19961112
AU 9676807	A	19970605	AU 1996-76807
			19961113
PRIORITY APPLN. INFO.:			US 1995-6437P P
			19951113
			US 1996-748008 A
			19961112
			WO 1996-US18325 W
			19961113

AB The electrolytes are quasi-salt inorg. ionic liqs. which comprise the reaction product of a strong Lewis acid with an inorg. halide-donating mol., which comprises a substructure selected from NPX₃, SO₂X, and C(O)X, where X is a halogen. The strong Lewis acid is selected from AlCl₃, BCl₃, SbCl₃, and FeCl₃. These quasi-salt inorg. ionic liquid mixts. are useful electrolytes.

IT 13966-08-0DP, reaction product with aluminum chloride
 14700-21-1DP, reaction product with aluminum chloride
 23453-30-7DP, reaction product with aluminum chloride
 44584-14-7DP, reaction product with boron chloride
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
 (electrochem. stable electrolytes from)

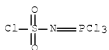
RN 13966-08-0 HCAPLUS

CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
 (CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 23453-30-7 HCAPLUS

CN Phosphorimidic trichloride, methyl- (8CI, 9CI) (CA INDEX NAME)

Cl3P=N-Me

RN 44584-14-7 HCAPLUS
CN Phosphorimidic trichloride, ethyl- (9CI) (CA INDEX NAME)

Cl3P=N-Et

IC ICM C01B021-06
ICS C01B025-10; C01C001-02; H01B001-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST battery electrolyte electrochem stable; halide donating
mol Lewis acid electrolyte
IT Battery electrolytes
(electrochem. stable which do not crystallize at ambient temperature)
IT 75-36-5DP, Acetyl chloride, reaction product with aluminum chloride
13966-08-0DP, reaction product with aluminum chloride
14700-21-1DP, reaction product with aluminum chloride
23453-30-7DP, reaction product with aluminum chloride
44584-14-7DP, reaction product with boron chloride
RL: PEP (Physical, engineering or chemical process); PRP
(Properties); SPN (Synthetic preparation); PREP (Preparation); PROC
(Process)
(electrochem. stable electrolytes from)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L37 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1997:440216 HCAPLUS Full-text

DOCUMENT NUMBER: 127:53456

ORIGINAL REFERENCE NO.: 127:10137a,10140a

TITLE: Sulfonyl/phospho-compound solvent for
high-conductivity electrolyte solutions and
secondary batteries incorporating
these solutions

INVENTOR(S): Angell, Charles Austen; Zhang, Sheng Shui; Xu,
Kang

PATENT ASSIGNEE(S): Arizona State University, Board of Regents, USA

SOURCE: PCT Int. Appl., 21 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9718595	A1	19970522	WO 1996-US18324	199611 13

W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK,
EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK,
LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,

May 24, 2009

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21

RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB,
GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA,
GN, ML, MR, NE, SN, TD, TG

AU 9710524 A 19970605 AU 1997-10524

199611
13

PRIORITY APPLN. INFO.:

US 1995-6436P

P

199511
13

WO 1996-US18324

W

199611
13

OTHER SOURCE(S): MARPAT 127:53456

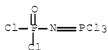
AB The solvent is selected from Cl₃PNSO₂Cl, Cl₃PNP(O)Cl₂, Cl₃PNCH₃, and Cl₃PNCH₂CH₃. A sulfonyl/phospho-compound electrolyte solution comprises an electrolyte solute and a sulfonyl/phospho-compound electrolyte solvent.

IT 13966-08-0P 14700-21-1P 23453-30-7P
44584-14-7P

RL: SPN (Synthetic preparation); PREP (Preparation)
(solvent for high-conductivity battery electrolyte
solns.)

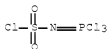
RN 13966-08-0 HCAPLUS

CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
(CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 23453-30-7 HCAPLUS

CN Phosphorimidic trichloride, methyl- (8CI, 9CI) (CA INDEX NAME)



RN 44584-14-7 HCAPLUS

CN Phosphorimidic trichloride, ethyl- (9CI) (CA INDEX NAME)

Cl3P—N—Et

IC ICM H01M006-14
ICS H01M006-16; H01M006-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 76
ST battery electrolyte solvent sulfonyl phospho compd
IT Battery electrolytes
(sulfonyl/phospho-compound solvent for high-conductivity)
IT 124-63-0, Methyl sulfonyl chloride
RL: DEV (Device component use); USES (Uses)
(solvent for high-conductivity battery electrolyte solns.)
IT 13966-08-0P 14700-21-1P 23453-30-7P
44584-14-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(solvent for high-conductivity battery electrolyte
solns.)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L37 ANSWER 11 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1996:744515 HCAPLUS Full-text

DOCUMENT NUMBER: 126:149660

ORIGINAL REFERENCE NO.: 126:28845a,28848a

TITLE: Room temperature inorganic "quasi-molten salts"
as alkali-metal electrolytes

AUTHOR(S): Xu, K.; Zhang, S.; Angell, C. A.

CORPORATE SOURCE: Dep. Chem., Arizona State Univ., Tempe, AZ,
85287-1604, USASOURCE: Journal of the Electrochemical Society (1996),
143(11), 3548-3554

CODEN: JESQAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

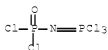
DOCUMENT TYPE: Journal

LANGUAGE: English

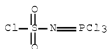
AB Room temperature inorg. liqs. of high ionic conductivity were prepared by reacting Lewis acid AlCl_3 with sulfonyl chlorides. The mechanism is not clear at this time since a crystal structure study of the 1:1 complex with $\text{CH}_3\text{SO}_2\text{Cl}$ ($T_m = 30^\circ$) is not consistent with a simple chloride transfer to create AlClO_4^- anions. The liquid is in a state somewhere between ionic and mol. A new term quasi-molten salt is adopted to describe this state. A comparably conducting liquid can be made using BCl_3 in place of AlCl_3 . Unlike their organic counterparts based on ammonium cations (e.g., pyridinium or imidazolium) which reduce in the presence of alkali metals, this inorg. class of cation shows great stability against electrochem. reduction (.apprx.-1.0 V vs. Li^+/Li), with the useful consequence that reversible lithium and sodium metal deposition/stripping can be supported. The electrochem. window for these quasi-salts with AlCl_3 ranges up to 5.0 V, and their room temperature conductivities exceed 10^{-4} S/cm. They dissolve lithium and sodium tetrachloroaluminate up to mole fraction .apprx.0.6 at 100° and intermediate compns. are permanently stable at ambient. The resultant lithium or sodium salt solns. exhibit electrochem. windows of 4.5-5.0 V vs. Li^+/Li or Na^+/Na and show room temperature conductivities of 10^{-3} to 10^{-2} S/cm. In preliminary charge/discharge tests, the cell $\text{Li}/\text{quasi-ionic liquid electrolyte}/\text{Li}^+\text{xMn}_2\text{O}_4$ showed a discharge capacity of .apprx.110 mA-h/(g of cathode) and sustained 80% of the initial capacity after 60 cycles, indicating

that these quasi-molten salt-based electrolytes are promising candidates for alkali-metal batteries.

- IT 13966-08-0P 14700-21-1P,
Trichlorophosphazosulfonyl chloride
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);
PREP (Preparation); RACT (Reactant or reagent)
(reaction with aluminum chloride: electrochem. potential window
and room temperature inorg. quasi-molten salts as alkali-metal
electrolytes)
- RN 13966-08-0 HCAPLUS
- CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
(CA INDEX NAME)



- RN 14700-21-1 HCAPLUS
- CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



- CC 72-2 (Electrochemistry)
Section cross-reference(s): 52, 68, 76
- ST room temp inorg quasi molten salt; alkali metal electrolyte quasi
molten salt; sulfonyl aluminum chloride melt electrochem window;
phosphoryl aluminum chloride melt electrochem window; electrochem
potential window sulfonyl phosphoryl chloroaluminate;
battery electrolyte inorg quasi molten salt
- IT Battery electrolytes
(of sulfonyl chloride or phosphoryl chloride compds. with
aluminum chloride)
- IT 6041-61-8P 13966-08-0P 14700-21-1P,
Trichlorophosphazosulfonyl chloride
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);
PREP (Preparation); RACT (Reactant or reagent)
(reaction with aluminum chloride: electrochem. potential window
and room temperature inorg. quasi-molten salts as alkali-metal
electrolytes)

L37 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1996:582562 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 125:252809

ORIGINAL REFERENCE NO.: 125:47151a,47154a

TITLE: Inorganic electrolyte solutions and gels for
rechargeable lithium batteries

AUTHOR(S): Xu, Kang; Day, Natalie D.; Angell, C. Austen
CORPORATE SOURCE: Dep. Chem., Arizona State Univ., Tempe, AZ,
85287-1604, USA

SOURCE: Journal of the Electrochemical Society (1996),
143(9), L209-L211
CODEN: JESOA; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

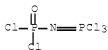
LANGUAGE: English

AB A class of inorg. oxychloride compds. have been evaluated for use as electrolytic solvents in rechargeable lithium batteries. Compared with SO₂-based electrolytes, these showed much improved safety while maintaining room temperature conductivities of 10⁻³-10⁻² S/cm and electrochem. voltage windows of 4.5-5.5 V vs. Li⁺/Li and supporting reversible Li metal deposition/stripping. With the addition of 2-5% polymer, the solns. acquire rubbery character with little loss of conductivity and no change in electrochem. stability. Preliminary charge/discharge tests with intercalation-type cathode as well as sulfur-based cathode showed that these inorg. electrolytes can operate with excellent reversibility.

IT 13966-08-0 14700-21-1, Trichlorophosphazosulfonyl chloride
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(solvent; inorg. electrolyte solns. and gels for rechargeable lithium batteries)

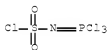
RN 13966-08-0 HCAPLUS

CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
(CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery inorg electrolyte soln gel; safety lithium battery inorg electrolyte oxychloride

IT Battery electrolytes
(inorg. electrolyte solns. and gels for rechargeable lithium batteries)

IT Electric conductivity and conduction
(ionic, inorg. electrolyte solns. and gels for rechargeable lithium batteries)

IT 9011-14-7, Pmma
RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte solns. and gels for rechargeable lithium batteries)

IT 14024-11-4, Lithium tetrachloroaluminate 90076-65-6
RL: DEV (Device component use); USES (Uses)

(electrolyte; inorg. electrolyte solns. and gels for rechargeable lithium batteries)
 IT 124-63-0, Methane sulfonylchloride 13966-08-0
 14700-21-1, Trichlorophosphazosulfonyl chloride
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (solvent; inorg. electrolyte solns. and gels for rechargeable lithium batteries)

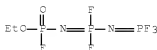
=> d ibib abs hitstr hitind 141 1-8

L41 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2007:1334246 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 147:544588
 TITLE: Nonaqueous electrolyte containing phosphazene compound and lithium ion secondary battery with high discharge efficiency having the same
 INVENTOR(S): Nakagawa, Hiroe; Katayama, Sadahiro; Nukuta, Toshiyuki
 PATENT ASSIGNEE(S): GS Yuasa Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007305551	A	20071122	JP 2006-135814	20060515
PRIORITY APPLN. INFO.:			JP 2006-135814	20060515

OTHER SOURCE(S): MARPAT 147:544588

AB Disclosed is a nonaq. electrolyte made from an organic material consisting of a lithium salt, and a salt at molten state at room temperature containing a (cyclic) phosphazene compound and a quaternary ammonium organic cation.
 IT 850650-07-6
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)
 RN 850650-07-6 HCAPLUS
 CN Phosphoramidofluoridic acid,
 N-[difluoro[(trifluorophosphoranylidene)amino]phosphoranylidene]-,
 ethyl ester (CA INDEX NAME)



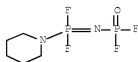
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq electrolyte cyclic phosphazene compd lithium ion secondary battery; quaternary ammonium org cation
 IT Secondary batteries
 (lithium; nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)
 IT Battery electrolytes
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)
 IT Quaternary ammonium compounds, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)
 IT 33027-66-6 90076-65-6, LiTFSi 132843-44-8, Lithium bis(perfluoroethanesulfonyl)imide 143314-16-3,
 1-Ethyl-3-methylimidazolium tetrafluoroborate 174501-64-5,
 1-Butyl-3-methylimidazolium hexafluorophosphate 174501-65-6,
 1-n-Butyl-3-methylimidazolium tetrafluoroborate 859650-07-6
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

L41 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2005:450196 HCAPLUS Full-text
 DOCUMENT NUMBER: 142:492196
 TITLE: Electrolytic double-layer capacitors employing nonaqueous electrolytic solutions and showing good charge performance
 INVENTOR(S): Kanno, Hiroshi; Otsuki, Masami
 PATENT ASSIGNEE(S): Bridgestone Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005135951	A	20050526	JP 2003-367066	20031028
PRIORITY APPLN. INFO.:			JP 2003-367066	20031028

AB The capacitors, having porous carbon as electrode active masses, contain nonaq. electrolytic solns. and satisfy the ratio of leakage current before and after 60° heat stability test ≤60%. The electrolytic solns. may contain aprotic solvents and P compds. and/or N compds. The capacitors may satisfy charge voltage ≥2.7 V.
 IT 852178-23-5
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (electrolytic solns.; double-layer capacitors containing oligocyclophosphazenes and showing good capacitance holding ratio)

RN 852178-23-5 HCAPLUS

CN Phosphoramidic difluoride, (difluoro-1-piperidinylphosphoranylidene)-
(9CI) (CA INDEX NAME)

IC ICM H01G009-038

CC 76-10 (Electric Phenomena)

IT 852178-23-5

RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)(electrolytic solns.; double-layer capacitors containing
oligocyclophosphazenes and showing good capacitance holding
ratio)

L41 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:445414 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 142:492192

TITLE: Electrolytic double-layer capacitors employing
nonaqueous electrolytic solutions

INVENTOR(S): Kanno, Hiroshi; Otsuki, Masatomo

PATENT ASSIGNEE(S): Bridgestone Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005135950	A	20050526	JP 2003-367052	200310 28
PRIORITY APPLN. INFO.:			JP 2003-367052	200310 28

AB The capacitors contain nonaq. electrolytic solns. preferably containing P compds. and/or N compds. and satisfy static capacitance degradation $\leq 10\%$ on heat stability test at 60° . The electrolytic solns. may contain aprotic organic solvents. The pos. and neg. electrodes of the capacitors may contain porous carbon (of surface functional group number ≤ 100 meq/g) as active masses. The capacitors show charge voltage of ≥ 2.5 V and long-term stability of capacitance performance.

IT 22474-63-1D, ethoxy-substituted derivs. 852178-23-5

852178-24-6 852178-25-7

RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)(electrolytic solns.; electrolytic
double-layer capacitors containing cyclic oligophosphazenes in nonaq.
electrolytic solns.)

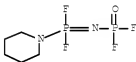
RN 22474-63-1 HCAPLUS

CN Phosphorimidic trifluoride, (difluorophosphinyl)- (8CI, 9CI) (CA INDEX NAME)



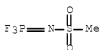
RN 852178-23-5 HCAPLUS

CN Phosphoramidic difluoride, (difluoro-1-piperidinylphosphoranylidene)- (9CI) (CA INDEX NAME)



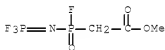
RN 852178-24-6 HCAPLUS

CN Methanesulfonamide, N-(trifluorophosphoranylidene)- (CA INDEX NAME)



RN 852178-25-7 HCAPLUS

CN Acetic acid, 2-[fluoro(trifluorophosphoranylidene)amino]phosphinyl]-, methyl ester (CA INDEX NAME)



IC ICM H01G009-038

ICS H01G009-058

CC 76-10 (Electric Phenomena)

IT 22474-63-1D, ethoxy-substituted derivs. 852178-23-5

852178-24-6 852178-25-7

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(electrolytic solns.; electrolytic

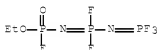
double-layer capacitors containing cyclic oligophosphazenes in nonaq.

electrolytic solns.)

ACCESSION NUMBER: 2005:368511 HCAPLUS Full-text
 DOCUMENT NUMBER: 142:433056
 TITLE: Secondary nonaqueous electrolyte battery
 INVENTOR(S): Koto, Tomoko
 PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005116306	A	20050428	JP 2003-348133	200310 07
PRIORITY APPLN. INFO.:			JP 2003-348133	200310 07

AB The battery has a cathode, containing a Li-Ni-Mn composite oxide : $\text{Li}_x\text{Ni}_y\text{Mn}_{2-y}\text{O}_{4-\delta}$ ($0 < x < 1.1$; $0.45 < y < 0.55$; and $0 \leq \delta < 0.4$) as a cathode active mass, an anode, and a nonaq. electrolyte solution; where the electrolyte solution contains 0.1-20 mass% phosphazene derivative
 IT 850650-07-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)
 RN 850650-07-6 HCAPLUS
 CN Phosphoramidofluoridic acid,
 N-[difluoro(trifluorophosphoranylidene)amino]phosphoranylidene]-, ethyl ester (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery cathode lithium manganese nickel oxide; battery electrolyte phosphazene deriv
 IT Battery cathodes
 Battery electrolytes
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)
 IT Polyphosphazenes
 RL: MOA (Modifier or additive use); USES (Uses)
 (cyclic; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT Secondary batteries
 (lithium; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
 7782-42-5, Graphite, uses 12031-75-3, Lithium manganese nickel oxide (LiMn_{1.5}Ni_{0.5}O₄) 14283-07-9, Lithium tetrafluoroborate
 21324-40-3, Lithium hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT 850650-07-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

L41 ANSWER 5 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2004:605979 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 141:149554
 TITLE: Separator for nonaqueous-electrolyte double layer capacitor
 INVENTOR(S): Kanno, Hiroshi; Otsuki, Masami; Eguchi, Shinichi
 PATENT ASSIGNEE(S): Bridgestone Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004214356	A	20040729	JP 2002-381018	20021227
PRIORITY APPLN. INFO.:			JP 2002-381018	20021227

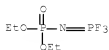
OTHER SOURCE(S): MARPAT 141:149554

AB A nonflammable separator for a nonaq.-electrolyte double layer capacitor comprises a finely porous film formed by adding a phosphazene derivative (or its isomer) to a polymer. Specifically, the polymer may comprise a polyolefin such as polyethylene or polypropylene.

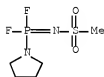
IT 722454-84-4 722454-85-5 722454-86-6
 RL: DEV (Device component use); USES (Uses)
 (separator containing phosphazene derivative for nonaq.-electrolyte double layer capacitor)

RN 722454-84-4 HCAPLUS

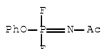
CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI) (CA INDEX NAME)



RN 722454-85-5 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-
(9CI) (CA INDEX NAME)

RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA
INDEX NAME)

IC ICM H01G009-02

CC 76-10 (Electric Phenomena)

IT 2397-48-0 9002-88-4, Polyethylene 9003-07-0, Polypropylene

722454-84-4 722454-85-5 722454-86-6

724792-60-3

RL: DEV (Device component use); USES (Uses)

(separator containing phosphazene derivative for nonaq.-
electrolyte double layer capacitor)

L41 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:570217 HCAPLUS Full-text

DOCUMENT NUMBER: 141:126304

TITLE: Additive for secondary battery
nonaqueous electrolyte solution and the
battery

INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004059782 A1 20040715 WO 2003-JP16592 20031224

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2003292764 A1 20040722 AU 2003-292764 20031224

EP 1580832 A1 20050928 EP 2003-768180 20031224

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

CN 1732588 A 20060208 CN 2003-80107739 20031224

CN 100362689 C 20080116

US 20060046151 A1 20060302 US 2005-540558 20050624

PRIORITY APPLN. INFO.: JP 2002-377142 A 20021226

WO 2003-JP16592 W 20031224

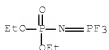
AB The additive comprises a phosphazene derivative represented by R13P = N-X (R1 = halo or monovalent substituent; and X = C, Si, N, P, O and/or S containing organic group). The battery has a nonaq. electrolyte solution comprising the above additive, a cathode, and an anode.

IT 722454-84-4 722454-85-5 722454-86-6

RL: MOA (Modifier or additive use); USES (Uses)
(additives containing phosphazene derivs. for secondary battery electrolytes)

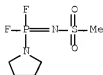
RN 722454-84-4 HCAPLUS

CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI) (CA INDEX NAME)



RN 722454-85-5 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-
(9CI) (CA INDEX NAME)



RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA
INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery nonaq electrolyte additive
phosphazene deriv

IT Battery electrolytes

(additives containing phosphazene derivs. for secondary
battery electrolytes)

IT Secondary batteries

(lithium; additives containing phosphazene derivs. for secondary
battery electrolytes)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium
hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(additives containing phosphazene derivs. for secondary
battery electrolytes)

IT 2397-48-0 722454-84-4 722454-85-5
722454-86-6

RL: MOA (Modifier or additive use); USES (Uses)

(additives containing phosphazene derivs. for secondary
battery electrolytes)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L41 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:570177 HCAPLUS Full-text

DOCUMENT NUMBER: 141:132681

TITLE: Phosphazene derivative additives for nonaqueous
electrolytic solution and nonaqueous electrolyte
electric double-layer capacitors

INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

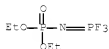
SOURCE: PCT Int. Appl., 31 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

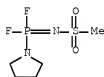
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004059671	A1	20040715	WO 2003-JP16585	20031224
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MM, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003292758	A1	20040722	AU 2003-292758	20031224
EP 1577913	A1	20050921	EP 2003-768173	20031224
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1732541	A	20060208	CN 2003-80107740	20031224
US 20060092596	A1	20060504	US 2005-540565	20050624
PRIORITY APPLN. INFO.:			JP 2002-377128	A 20021226
			WO 2003-JP16585	W 20031224
AB	The title additives in the nonaq. electrolytic solns. for elec. double-layer capacitors are phosphazene derivs. R13P-N (R1 = halo, monovalent substituent; X = organic group containing C, Si, N, P, O, S). The additives have high dissoln. power for supporting salts and a low viscosity. A nonaq. electrolyte elec. double-layer capacitors provided with the title electrolytic solution containing the additives have excellent fast or high-rate charge-discharge characteristics.			
IT	722454-84-4P 722454-85-5P 722454-86-6P RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation) (phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)			
RN	722454-84-4 HCAPLUS			

CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester
(9CI) (CA INDEX NAME)



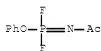
RN 722454-85-5 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-
(9CI) (CA INDEX NAME)



RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA
INDEX NAME)



IC ICM H01G009-038

CC 76-10 (Electric Phenomena)

IT 722454-84-4P 722454-85-5P 722454-86-6P

RL: PNU (Preparation, unclassified); PRP (Properties); PREP
(Preparation)

(phosphazene derivative additives for nonaq. electrolytic
solution and nonaq. electrolyte elec. double-layer
capacitors)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L41 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:139816 HCAPLUS Full-text

DOCUMENT NUMBER: 140:184695

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Narioka, Yoshinori; Mori, Sumio

PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

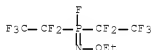
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004055208	A	20040219	JP 2002-208280	200207 17
PRIORITY APPLN. INFO.:			JP 2002-208280	200207 17

AB The battery has an active mass containing anode and a Li salt dissolved nonaq. electrolyte solution; where the electrolyte solution has a halo-containing phosphazene compound and the anode has a binder comprising a non-halo material.

IT 657348-91-9
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. having halo-containing phosphazene compds. for secondary lithium batteries)

RN 657348-91-9 HCAPLUS

CN Phosphinimidic fluoride, N-ethoxy-P,P-bis(pentafluoroethyl)- (9CI)
 (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-02; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery electrolyte halo contg phosphazene compd; anode binder nonhalo compd secondary battery

IT Fluoropolymers, uses
 Styrene-butadiene rubber, uses
 RL: DEV (Device component use); USES (Uses)
 (anode binder; anode binders containing non-halo materials for secondary lithium batteries)

IT Battery anodes
 (anode binders containing non-halo materials for secondary lithium batteries)

IT Battery electrolytes
 (electrolyte solns. having halo-containing phosphazene compds. for secondary lithium batteries)

IT Secondary batteries
 (secondary lithium batteries having halo-containing phosphazene compds. in electrolyte solns. and non-halo materials in anodes)

IT 7782-42-5, Graphite, uses
 RL: DEV (Device component use); USES (Uses)
 (anode active mass; anode binders containing non-halo materials for secondary lithium batteries)

IT 24937-79-9, PvdF
 RL: DEV (Device component use); USES (Uses)
 (anode binder; anode binders containing non-halo materials for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 21324-40-3, Lithium hexafluorophosphate 657348-91-9
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. having halo-containing phosphazene
 compds. for secondary lithium batteries)
 IT 9003-55-8
 RL: DEV (Device component use); USES (Uses)
 (styrene-butadiene rubber, anode binder; anode binders containing
 non-halo materials for secondary lithium batteries)

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L39 ANSWER 1 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2007:910885 HCAPLUS Full-text
 DOCUMENT NUMBER: 147:238866
 TITLE: Nonaqueous electrolyte lithium secondary
 batteries
 INVENTOR(S): Matsuda, Hiroaki; Yoshizawa, Hiroshi
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 13pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

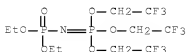
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007207455	A	20070816	JP 2006-21897	20060131
PRIORITY APPLN. INFO.:				20060131
				20060131

AB The battery includes anode, containing active materials alloying with Li, e.g. Si and/or Sn, catalyst elements for growing carbon nanofibers, and composite particles including carbon nanofibers grown on active material surfaces, and nonaq. electrolytes, containing ≥ 1 of phosphazenes and phosphoric acid esters. The batteries have excellent high-temperature storage stability.

IT 155270-25-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (anode active materials containing; nonaq. electrolyte
 lithium secondary batteries with anodes containing carbon
 nanofiber-grown active material particles and phosphazenes or
 phosphate esters)

RN 155270-25-0 HCAPLUS

CN Phosphorimidic acid, N-(diethoxyphosphinyl)-,
 tris(2,2,2-trifluoroethyl) ester (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte lithium battery high temp storage
 stability; carbon nanofiber nonaq battery anode; phosphate
 ester nonaq battery anode; anode nonaq battery
 phosphazene additive

IT Phosphates, uses
 Phosphazenes
 RL: MOA (Modifier or additive use); USES (Uses)
 (anode active materials containing; nonaq. electrolyte lithium
 secondary batteries with anodes containing carbon
 nanofiber-grown active material particles and phosphazenes or
 phosphate esters)

IT Nanofibers
 (carbon; nonaq. electrolyte lithium secondary batteries
 with anodes containing carbon nanofiber-grown active material
 particles and phosphazenes or phosphate esters)

IT Secondary batteries
 (lithium; nonaq. electrolyte lithium secondary batteries
 with anodes containing carbon nanofiber-grown active material
 particles and phosphazenes or phosphate esters)

IT Carbon fibers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nanofiber; nonaq. electrolyte lithium secondary
 batteries with anodes containing carbon nanofiber-grown
 active material particles and phosphazenes or phosphate esters)

IT Battery anodes
 Battery electrolytes
 (nonaq. electrolyte lithium secondary batteries with
 anodes containing carbon nanofiber-grown active material particles
 and phosphazenes or phosphate esters)

IT 12039-83-7, Titanium silicide (TiSi2)
 RL: TEM (Technical or engineered material use); USES (Uses)
 (Ti-Si alloy anode active materials containing; nonaq. electrolyte
 lithium secondary batteries with anodes containing carbon
 nanofiber-grown active material particles and phosphazenes or
 phosphate esters)

IT 512-56-1, Trimethyl phosphate 1065-05-0 2196-04-5, Ethylene
 methyl phosphate 155270-25-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (anode active materials containing; nonaq. electrolyte
 lithium secondary batteries with anodes containing carbon
 nanofiber-grown active material particles and phosphazenes or
 phosphate esters)

IT 7440-21-3, Silicon, uses 18282-10-5, Tin oxide (SnO2) 56728-61-1
 113443-18-8, Silicon oxide (SiO)
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode active materials; nonaq. electrolyte lithium secondary
 batteries with anodes containing carbon nanofiber-grown
 active material particles and phosphazenes or phosphate esters)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
 277299-63-5, Sol-Rite
 RL: TEM (Technical or engineered material use); USES (Uses)
 (electrolyte; nonaq. electrolyte lithium secondary
 batteries with anodes containing carbon nanofiber-grown
 active material particles and phosphazenes or phosphate esters)

IT 10141-05-6, Cobalt nitrate 13138-45-9, Nickel nitrate
 21324-40-3, Lithium hexafluorophosphate
 RL: TEM (Technical or engineered material use); USES (Uses)

(nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)

L39 ANSWER 2 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2006:1122520 HCAPLUS Full-text
 DOCUMENT NUMBER: 145:457670
 TITLE: Nonaqueous electrolyte solution with high safety, evaluation of its safety, and batteries and electric double-layer capacitors using it
 INVENTOR(S): Eguchi, Shinichi
 PATENT ASSIGNEE(S): Bridgestone Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 30pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006294334	A	20061026	JP 2005-110883	20050407
PRIORITY APPLN. INFO.:			JP 2005-110883	20050407

OTHER SOURCE(S): MARPAT 145:457670

AB The disclosed solution is characterized by having maximum heat generation rate ≤ 550 kW/m² or total heat generation ≤ 10 MJ/m² when measured by a cone calorimeter. Preferably, the solution contains cyclic phosphazene compds. represented by (NPR1₂)_n (R1 = halo, monovalent substituent; n = 3-4), fluorophosphates represented by O:PF₂R₂ (R2 = halo, alkoxy, aryloxy; at least one of R2 is alkoxy or aryloxy), and supporting electrolytes, or the solution comprises solvents composed of only phosphate derivs. and supporting electrolytes. Safety of the solution is evaluated by measuring its maximum heat generation rate or total heat generation by using a cone calorimeter. Secondary nonaq. electrolyte batteries and nonaq. electrolyte elec. double-layer capacitors using the solution are also claimed. Explosion or ignition of the batteries and the capacitors are suppressed.

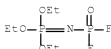
IT 913182-28-2

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(nonaq. electrolyte solution with low heat generation, preferably containing phosphazene and phosphate, for high safety for batteries and elec. double-layer capacitors)

RN 913182-28-2 HCAPLUS

CN Phosphorimidic acid, (difluorophosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76

ST nonaq electrolyte soln safety phosphazene phosphate; safety
 evaluation nonaq electrolyte soln heat generation cone calorimeter;
 battery elec double layer capacitor nonaq electrolyte soln

IT Capacitors
 (double layer; nonaq. electrolyte solution with low heat generation,
 preferably containing phosphazene and phosphate, for high safety for
 batteries and elec. double-layer capacitors)

IT Secondary batteries
 (nonaq. electrolyte solution with low heat generation, preferably
 containing phosphazene and phosphate, for high safety for
 batteries and elec. double-layer capacitors)

IT Electrolytic solutions
 (nonaq.; nonaq. electrolyte solution with low heat generation,
 preferably containing phosphazene and phosphate, for high safety for
 batteries and elec. double-layer capacitors)

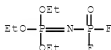
IT 78-40-0, Triethyl phosphate 358-74-7, Diethyl fluorophosphate
 460-52-6, Ethyl difluorophosphate 512-56-1, Trimethyl phosphate
 1126-52-9 5954-50-7, Dimethyl fluorophosphate 14700-00-6
 15391-51-2, Phosphoramidic difluoride 22382-13-4, Methyl
 difluorophosphate 26078-16-0 26471-90-9 33027-66-6
 33027-68-8 55593-36-7 607744-75-2 882692-99-1
 913182-28-2
 RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)
 (nonaq. electrolyte solution with low heat generation,
 preferably containing phosphazene and phosphate, for high safety for
 batteries and elec. double-layer capacitors)

L39 ANSWER 3 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2006:1122518 HCAPLUS Full-text
 DOCUMENT NUMBER: 145:457669
 TITLE: Nonaqueous electrolyte solution with high
 safety, evaluation of its safety, and
 batteries and electric double-layer
 capacitors using it
 Eguchi, Shinichi
 INVENTOR(S):
 PATENT ASSIGNEE(S): Bridgestone Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 30pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006294332	A	20061026	JP 2005-110865	200504 07
PRIORITY APPLN. INFO.:			JP 2005-110865	200504 07

OTHER SOURCE(S): MARPAT 145:457669

- AB The disclosed solution is characterized by having flame temperature $\leq 2700^{\circ}$ when a flame at $700-800^{\circ}$ is brought in contact with the solution. Preferably, the solution contains cyclic phosphazene compds. represented by (NPR12)_n (R1 = halo, monovalent substituent; n = 3-4), fluorophosphates represented by O:PF(R2) (R2 = halo, alkoxy, aryloxy; at least one of R2 is alkoxy or aryloxy), and supporting electrolytes. Safety of the solution is evaluated by measuring its flame temperature by bringing a flame at $700-800^{\circ}$ in contact with the solution. Secondary nonaq. electrolyte batteries and nonaq. electrolyte elec. double-layer capacitors using the solution are also claimed. Explosion or ignition of the batteries and the capacitors are suppressed.
- IT 913182-28-2
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- RN 913182-28-2 HCAPLUS
- CN Phosphorimidic acid, (difluorophosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76
- ST nonaq electrolyte soln safety phosphazene phosphate; safety evaluation nonaq electrolyte soln flame temp; battery elec double layer capacitor nonaq electrolyte soln
- IT Capacitors
 (double layer; nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- IT Secondary batteries
 (nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- IT Electrolytic solutions
 (nonaq.; nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- IT 78-40-0, Triethyl phosphate 358-74-7, Diethyl fluorophosphate 460-52-6, Ethyl difluorophosphate 512-56-1, Trimethyl phosphate 1126-52-9, 5954-50-7, Dimethyl fluorophosphate 14700-00-6, 15391-51-2, Phosphoramidic difluoride 22382-13-4, Methyl difluorophosphate 26078-16-0, 26471-90-9, 33027-66-6, 33027-68-8, 55593-36-7, 607744-75-2, 882692-99-1, 913182-28-2
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)

L39 ANSWER 4 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:521388 HCAPLUS Full-text

DOCUMENT NUMBER: 143:214240

TITLE: Molecular modeling studies of polymer electrolytes for power sources

AUTHOR(S): Balbuena, Perla B.; Lamas, Eduardo J.; Wang, Yixuan

CORPORATE SOURCE: Department of Chemical Engineering, Texas A&M University, College Station, TX, 77843, USA

SOURCE: Electrochimica Acta (2005), 50(19), 3788-3795
CODEN: ELCAAV; ISSN: 0013-4686

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB D. functional theory and classical mol. dynamics simulations permit a study of ionic and mol. transport useful for the design of polymer electrolyte membranes. The authors consider 2 systems: (a) ionic transport in poly(ethylene oxide) compared to that in a polyphosphazene membrane, a good ionic carrier but a bad H₂O carrier; and (b) transport of O and protons through hydrated Nafion in the vicinity of a catalyst phase. In polyphosphazene membranes, N atoms interact more strongly with Li ions than ether oxygens do. As a result of different complexation of Li⁺ with the polymer sites, Li⁺ has a much higher diffusion coefficient in polyphosphazene than in polyethylene oxide electrolyte membranes, which is of interest in Li-H₂O battery technol. For the hydrated membrane/catalyst interface, the simulations show that the Nafion membrane used in low-temperature fuel cells interacts strongly with the catalytic metal nanoparticles, directing the side chain towards the catalyst surface. Results for various degrees of hydration of the membrane illustrate the formation of H₂O clusters surrounding the polymer hydrophilic sites, and reveal how the connectivity of these clusters may determine the transport mechanism of protons and mol. species.

IT 54000-84-9

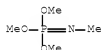
RL: PRP (Properties); TEM (Technical or engineered material use);

USES (Uses)

(in mol. modeling of polymer electrolytes for lithium batteries and fuel cells)

RN 54000-84-9 HCAPLUS

CN Phosphorimidic acid, methyl-, trimethyl ester (9CI) (CA INDEX NAME)

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 65

ST polymer electrolyte mol model lithium battery fuel cell

IT Polyoxyalkylenes, uses

RL: PRP (Properties); TEM (Technical or engineered material use);

USES (Uses)

(fluorine- and sulfo-containing, ionomers; in mol. modeling of polymer electrolytes for lithium batteries and fuel cells)

IT Polyoxyalkylenes, uses

RL: PRP (Properties); TEM (Technical or engineered material use);

USES (Uses)

(in mol. modeling of polymer electrolytes for lithium

batteries and fuel cells)

IT Battery electrolytes
Fuel cell electrolytes
Fuel cell separators
Molecular modeling
Polymer electrolytes
(mol. modeling of polymer electrolytes for lithium
batteries and fuel cells)

IT Fluoropolymers, uses
RL: PRP (Properties); TEM (Technical or engineered material use);
USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; in mol. modeling of
polymer electrolytes for lithium batteries and fuel
cells)

IT Ionomers
RL: PRP (Properties); TEM (Technical or engineered material use);
USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; in mol. modeling
of polymer electrolytes for lithium batteries and fuel
cells)

IT 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(in mol. modeling of polymer electrolytes for lithium
batteries and fuel cells)

IT 25322-68-3, Poly(ethylene oxide) 54000-84-9
RL: PRP (Properties); TEM (Technical or engineered material use);
USES (Uses)
(in mol. modeling of polymer electrolytes for lithium
batteries and fuel cells)

IT 7440-06-4, Platinum, uses 14283-07-9
RL: TEM (Technical or engineered material use); USES (Uses)
(in mol. modeling of polymer electrolytes for lithium
batteries and fuel cells)

REFERENCE COUNT: 36 THERE ARE 36 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L39 ANSWER 5 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:570217 HCAPLUS Full-text
DOCUMENT NUMBER: 141:126304
TITLE: Additive for secondary battery
nonaqueous electrolyte solution and the
battery
INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro
PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
SOURCE: PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004059782	A1	20040715	WO 2003-JP16592	

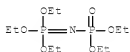
200312
24

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
 MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE,
 SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,
 VN, YU, ZA, ZM, ZW
 RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
 AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE,
 DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
 SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
 MR, NE, SN, TD, TG

AU 2003292764 A1 20040722 AU 2003-292764 200312
 24
 EP 1580832 A1 20050928 EP 2003-768180 200312
 24
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,
 SK
 CN 1732588 A 20060208 CN 2003-80107739 200312
 24
 CN 100362689 C 20080116
 US 20060046151 A1 20060302 US 2005-540558 200506
 24
 PRIORITY APPLN. INFO.: JP 2002-377142 A 200212
 26
 WO 2003-JP16592 W 200312
 24

AB The additive comprises a phosphazene derivative represented by R13P = N-X (R1
 = halo or monovalent substituent; and X = C, Si, N, P, O and/or S containing
 organic group). The battery has a non-aqueous electrolyte solution comprising the
 above additive, a cathode, and an anode.
 IT 2397-48-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 RN 2397-48-0 HCAPLUS
 CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery non-aqueous electrolyte additive
 phosphazene deriv
 IT Battery electrolytes
 (additives containing phosphazene derivs. for secondary

battery electrolytes)
 IT Secondary batteries
 (lithium; additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium
 hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT 2397-48-0 722454-84-4 722454-85-5 722454-86-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L39 ANSWER 6 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2003:377216 HCAPLUS Full-text
 DOCUMENT NUMBER: 138:371761
 TITLE: Primary nonaqueous electrolyte battery
 and additive for the battery
 electrolyte
 INVENTOR(S): Otsuki, Masashi; Eguchi, Shinichi; Kanno, Yushi
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
 SOURCE: PCT Int. Appl., 101 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003041197	A1	20030515	WO 2002-JP11173	200210 28
W: CA, JP, KR, US RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
CA 2465845	A1	20030515	CA 2002-2465845	200210 28
EP 1443578	A1	20040804	EP 2002-775406	200210 28
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR, BG, CZ, EE, SK				
US 20050123836	A1	20050609	US 2004-494936	200405 07
PRIORITY APPLN. INFO.:			JP 2001-341464	A 200111 07
			JP 2001-371305	A 200112 05

JP 2001-371356	A	200112 05
JP 2001-371378	A	200112 05
JP 2001-371499	A	200112 05
WO 2002-JP11173	W	200210 28

OTHER SOURCE(S): MARPAT 138:371761
GI



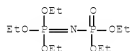
AB The battery uses a nonaq. electrolyte solution containing a supporting salt and a phosphazene derivative additive having viscosity ≤ 100 cP at 25°. The electrolyte solution may contain an aprotic solvent. The additive is preferably I (R1-3 = monovalent substituent or halogen, X1 = organic group containing C, Si, Ge, Sn, N, P, As, Sb, Bi, O, S, Se, Te, and/or Po), Y1-3 = linking group, bond, element or II (R4 = monovalent substituent or halogen, and may differ from each, n = 3-15).

IT 2397-48-0 97682-87-6 324575-25-9
524699-03-4

RL: MOA (Modifier or additive use); USES (Uses)
(phosphazene derivative additives in electrolytes for
primary lithium batteries)

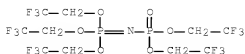
RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



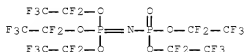
RN 97682-87-6 HCAPLUS

CN Phosphorimidic acid, [bis(2,2,2-trifluoroethoxy)phosphinyl]-, tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)



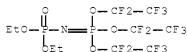
RN 324575-25-9 HCAPLUS

CN Phosphorimidic acid, [bis(pentafluoroethoxy)phosphinyl]-, tris(pentafluoroethyl) ester (9CI) (CA INDEX NAME)



RN 524699-03-4 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, tris(pentafluoroethyl) ester (9CI) (CA INDEX NAME)



IC ICM H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST primary nonaq battery electrolyte soln phosphazene additive

IT Battery electrolytes

(phosphazene derivative additives in electrolytes for primary lithium batteries)

IT 96-48-0, γ -Butyrolactone 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 90076-65-6

RL: DEV (Device component use); USES (Uses)

(phosphazene derivative additives in electrolytes for primary lithium batteries)

IT 2397-48-0 3654-42-0 28655-96-1, Poly[nitrilo(difluorophosphoranylidene)] 28655-96-1D, Poly[nitrilo(difluorophosphoranylidene)], alkyl alkoxy or Ph substituted, fluoro derivs. 97682-87-6 324575-25-9 524699-03-4

RL: MOA (Modifier or additive use); USES (Uses)

(phosphazene derivative additives in electrolytes for primary lithium batteries)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L39 ANSWER 7 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:42601 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 138:92872

TITLE: Polymer electrolyte and polymer electrolyte

INVENTOR(S): battery
 Otsuki, Masashi; Endo, Shigeki; Ogino, Takao
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
 SOURCE: PCT Int. Appl., 33 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003005478	A1	20030116	WO 2002-JP6570	20020628
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2451790	A1	20030116	CA 2002-2451790	20020628
AU 2002313296	A1	20030121	AU 2002-313296	20020628
EP 1414096	A1	20040428	EP 2002-738860	20020628
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
CN 1522477	A	20040818	CN 2002-813412	20020628
CN 100413140	C	20080820		
CN 1697243	A	20051116	CN 2005-10079713	20020628
CN 100377415	C	20080326		
US 20040192853	A1	20040930	US 2004-482804	20040105
PRIORITY APPLN. INFO.:				20010705
JP 2001-204415				A
JP 2001-206763				A
JP 2001-242051				A
				20010706
				20010809

JP 2001-327618	A	200110 25
JP 2001-207705	A	200107 09
JP 2001-207706	A	200107 09
JP 2001-242067	A	200108 09
CN 2002-813411	A3	200206 28
WO 2002-JP6570	W	200206 28

OTHER SOURCE(S): MARPAT 138:92872
GI



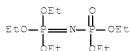
AB The battery has a cathode, an anode, and an electrolyte mixture, containing a supporting electrolyte and a polymer containing a phosphazene derivative. The phosphazene derivative is I (R1-3 = halogen or monovalent substituents, X = C, Si, Ge, Sn, N, As, Sb, Bi, O, S, Se, Te, Po or groups containing ≥ 1 of these elements, Y1-3 = bivalent connection groups or elements or a single bond) or II (R4 = halogen or monovalent substituent, n = 3-14).

IT 2397-48-0

RL: DEV (Device component use); USES (Uses)
(polymer electrolytes containing supporting
electrolytes and phosphazene derivs. for secondary
lithium batteries)

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



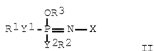
IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST battery polymer electrolyte phosphazene deriv
 IT Battery electrolytes
 (polymer electrolytes containing supporting electrolytes and
 phosphazene derivs. for secondary lithium batteries)
 IT Phosphazenes
 Polyoxyaalkylenes, uses
 RL: DEV (Device component use); USES (Uses)
 (polymer electrolytes containing supporting electrolytes and
 phosphazene derivs. for secondary lithium batteries)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 2397-48-0 21324-40-3, Lithium hexafluorophosphate
 25322-68-3, Poly(ethylene oxide) 33027-66-6 471894-05-0
 485399-26-6 485399-27-7
 RL: DEV (Device component use); USES (Uses)
 (polymer electrolytes containing supporting
 electrolytes and phosphazene derivs. for secondary
 lithium batteries)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

L39 ANSWER 8 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2002:185512 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:219552
 TITLE: Additive for secondary nonaqueous electrolyte
 battery and double layer capacitor
 INVENTOR(S): Otsuki, Masashi; Endo, Shigeki; Ogino, Takao
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
 SOURCE: PCT Int. Appl., 47 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
WO 2002021630	A1	20020314	WO 2001-JP7691	20010905
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GU, ML, MR, NE, SN, TD, TG			
AU 2001084431	A	20020322	AU 2001-84431	20010905
CA 2422108	A1	20030307	CA 2001-2422108	20010905

EP 1328036 A1 20030716 EP 2001-963432 20010905
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
 CN 1219338 C 20050914 CN 2001-815211 20010905
 US 20030175597 A1 20030918 US 2003-363172 20030331
 US 7067219 B2 20060627
 PRIORITY APPLN. INFO.: JP 2000-272084 A 20000907
 JP 2000-272085 A 20000907
 WO 2001-JP7691 W 20010905
 OTHER SOURCE(S): MARPAT 136:219552
 GI

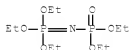


AB The additive contains phosphazene derivs. I or II, where R1-3 = monovalent substituent or halogen atom; X = substituent containing C, Si, Ge, Sn, N, P, As, Sb, Bi, O, S, Se, Te, and/or Po; and Y1 and Y2 = bivalent connecting group, bivalent element, or single bond.

IT 2397-48-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (phosphazene derivative additives in nonaq. electrolytes
 for secondary lithium batteries and double layer capacitors)

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M006-16; H01G009-038

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76

ST secondary battery nonaq electrolyte phosphazene deriv
 additive; double layer capacitor electrolyte phosphazene deriv
 additive

IT Battery electrolytes
 (electrolytes containing phosphazene derivative additives for secondary
 lithium batteries)

IT Phosphazenes
 RL: MOA (Modifier or additive use); USES (Uses)
 (phosphazene derivative additives in nonaq. electrolytes for
 secondary lithium batteries and double layer
 capacitors)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 14283-07-9, Lithium fluoroborate 21324-40-3, Lithium
 hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (electrolytes containing phosphazene derivative additives for secondary
 lithium batteries)

IT 2397-48-0 3654-42-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (phosphazene derivative additives in nonaq. electrolytes
 for secondary lithium batteries and double layer
 capacitors)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

L39 ANSWER 9 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:881968 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:21960

TITLE: Nonaqueous electrolyte battery

INVENTOR(S): Kikuchi, Masahiro; Yonekawa, Fumihiro; Wakui,
 Atsushi; Kamata, Tomohisa

PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001338683	A	20011207	JP 2000-157055	200005 26
PRIORITY APPLN. INFO.:			JP 2000-157055	200005 26

OTHER SOURCE(S): MARPAT 136:21960

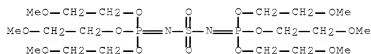
AB The battery has a Li intercalating spinel type Li Mn oxide cathode, a Li
 intercalating anode, and nonaq. Li ion electrolyte solution containing a Mn
 dissoln. inhibitor, which is a phosphazene derivative selected from
 (R0)3P:NSO3R1 (R and R1 = monovalent organic group) and (R2O)3P:NSO2N:P(OR)3
 (R2 and R3 = monovalent organic group).

IT 271771-14-3 271771-15-4
 RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

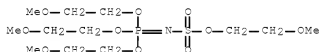
RN 271771-14-3 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



RN 271771-15-4 HCAPLUS

CN Sulfamic acid, N-[tris(2-methoxyethoxy)phosphinylidene]-, 2-methoxyethyl ester (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte manganese dissoln

inhibitor phosphazene

IT Battery cathodes

Battery electrolytes

(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

IT Secondary batteries

(lithium; electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

12057-17-9, Lithium manganese oxide (LiMn2O4) 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

IT 271771-14-3 271771-15-4

RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

IT 7439-96-5, Manganese, miscellaneous

RL: MSC (Miscellaneous)

(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

May 24, 2009

10/540,558

54

L39 ANSWER 10 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2001:881967 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:21959
 TITLE: Nonaqueous electrolyte battery
 INVENTOR(S): Fui, Samu; Narita, Yukio; Saito, Tadashi; Ohara, Nobuhiko; Wakui, Atsushi; Kamata, Tomohisa
 PATENT ASSIGNEE(S): Sony Corp., Japan; Nippon Chemical Industrial Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001338682	A	20011207	JP 2000-157054	20000526
PRIORITY APPLN. INFO.:			JP 2000-157054	20000526

OTHER SOURCE(S): MARPAT 136:21959

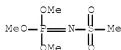
AB The battery has a cathode, a Li intercalating anode, and a nonaq. Li+ electrolyte solution containing a phosphazene derivative (RO)3P:NSO2R', where R = (halogenated) C1-10 (branched) alkyl or (halogenated) Me(OCH2CH2)n- (n = 1-5), and R' = (halogenated) C1-12 alkyl or Ph group that may have halogen, alkoxy, and/or C1-4 alkyl substituents.

IT 7109-06-0 62461-25-0 377780-53-5
 377780-54-6 377780-55-7 377780-56-8
 378795-41-6 378795-42-7 378795-43-8
 378795-44-9 378795-45-0 378795-46-1
 378795-47-2 378795-48-3 378795-49-4
 378795-50-7

RL: MOA (Modifier or additive use); USES (Uses)
 (solvent mixts. containing phosphazene derives for electrolyte solns. in secondary lithium batteries)

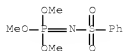
RN 7109-06-0 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, trimethyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)

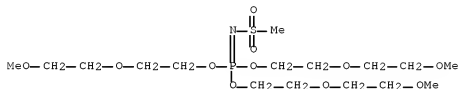


RN 62461-25-0 HCAPLUS

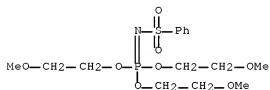
CN Phosphorimidic acid, (phenylsulfonyl)-, trimethyl ester (6CI, 9CI) (CA INDEX NAME)



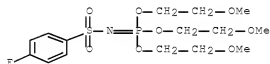
RN 377780-53-5 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-,
tris[2-(2-methoxyethoxy)ethyl] ester (9CI) (CA INDEX NAME)

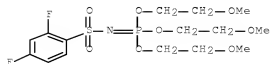
RN 377780-54-6 HCAPLUS

CN Phosphorimidic acid, (phenylsulfonyl)-, tris(2-methoxyethyl) ester
(9CI) (CA INDEX NAME)

RN 377780-55-7 HCAPLUS

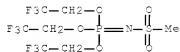
CN Phosphorimidic acid, [(4-fluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

RN 377780-56-8 HCAPLUS

CN Phosphorimidic acid, [(2,4-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

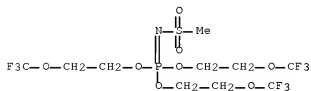
RN 378795-41-6 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)



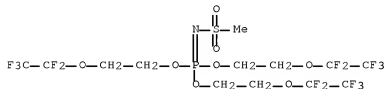
RN 378795-42-7 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris[2-(trifluoromethoxy)ethyl] ester (9CI) (CA INDEX NAME)



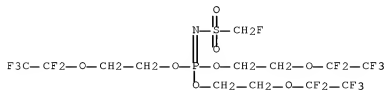
RN 378795-43-8 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris[2-(pentafluoroethoxy)ethyl] ester (9CI) (CA INDEX NAME)



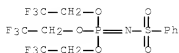
RN 378795-44-9 HCAPLUS

CN Phosphorimidic acid, [(fluoromethyl)sulfonyl]-, tris[2-(pentafluoroethoxy)ethyl] ester (9CI) (CA INDEX NAME)

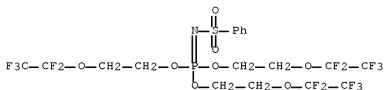


RN 378795-45-0 HCAPLUS

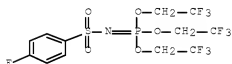
CN Phosphorimidic acid, (phenylsulfonyl)-, tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)



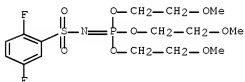
RN 378795-46-1 HCAPLUS

CN Phosphorimidic acid, (phenylsulfonyl)-,
tris[2-(pentafluoroethoxy)ethyl] ester (9CI) (CA INDEX NAME)

RN 378795-47-2 HCAPLUS

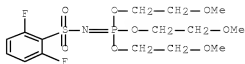
CN Phosphorimidic acid, [(4-fluorophenyl)sulfonyl]-,
tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)

RN 378795-48-3 HCAPLUS

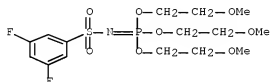
CN Phosphorimidic acid, [(2,5-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

RN 378795-49-4 HCAPLUS

CN Phosphorimidic acid, [(2,6-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



RN 378795-50-7 HCAPLUS

CN Phosphorimidic acid, [(3,5-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte phosphazene deriv

IT Battery electrolytes

(solvent mixts. containing phosphazene derives for electrolyte solns.
in secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

RL: DEV (Device component use); USES (Uses)

(solvent mixts. containing phosphazene derives for electrolyte solns.
in secondary lithium batteries)

IT 7109-06-0 62461-25-0 377780-53-5

377780-54-6 377780-55-7 377780-56-8

378795-41-6 378795-42-7 378795-43-8

378795-44-9 378795-45-0 378795-46-1

378795-47-2 378795-48-3 378795-49-4

378795-50-7

RL: MOA (Modifier or additive use); USES (Uses)

(solvent mixts. containing phosphazene derives for
electrolyte solns. in secondary lithium batteries
)

L39 ANSWER 11 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:873246 HCAPLUS Full-text

DOCUMENT NUMBER: 136:20156

TITLE: Preparation of sulfonyl-containing phosphazenes

INVENTOR(S): Narita, Yukio; Saito, Tadashi; Ohara, Nobuhiko;

Wakui, Atsushi; Kamata, Tomohisa

PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001335590

A

20011204

JP 2000-157053

200005

26

PRIORITY APPLN. INFO.:

JP 2000-157053

200005

26

OTHER SOURCE(S):

CASREACT 136:20156; MARPAT 136:20156

AB The title (R1O)3P:NSO2R2 [R1 = (CH2CH2O)nMe which may be substituted with halo (n = 1-5); R2 = Cl-12 (halo)alkyl, (halo)phenyl, Cl-4 alkyl-(halo)phenyl] (I), useful as electrolytes for nonaq. secondary batteries, flame retardants for lubricants, etc., are prepared by treating phosphorus pentahalides with H2NSO2R2 (R2 = same as above) and then treating the resulting X3P:NSO2R2 (R2 = same as above; X = halo) (II) with R1OM (R1 = same as above; M = alkali metal). E.g., a mixture of PCl5, PhSO2NH2, toluene, and THF was stirred at room temperature for 2.5 h to give 96.9% II (R2 = Ph, X = Cl) (III). An alcoholate solution, prepared from MeOCH2CH2OH and NaH in THF, was added dropwise to a mixture of III and toluene at 0-10° and then the reaction mixture was stirred at room temperature for 3.5 h to give 78.4% I (R1 = CH2CH2OMe, R2 = Ph).

IT 377780-53-5P 377780-54-6P 377780-55-7P

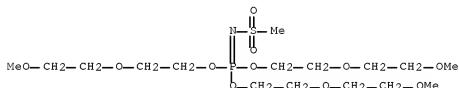
377780-56-8P

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(preparation of phosphazosulfonyl compds. as electrolytes for nonaq. secondary batteries)

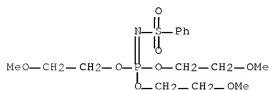
RN 377780-53-5 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris[2-(2-methoxyethoxy)ethyl] ester (9CI) (CA INDEX NAME)



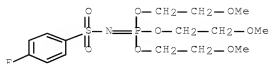
RN 377780-54-6 HCAPLUS

CN Phosphorimidic acid, (phenylsulfonyl)-, tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



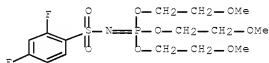
RN 377780-55-7 HCAPLUS

CN Phosphorimidic acid, [(4-fluorophenyl)sulfonyl]-, tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



RN 377780-56-8 HCAPLUS

CN Phosphorimidic acid, [(2,4-difluorophenyl)sulfonyl]-, tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



IC ICM C07F009-24

ICS H01G009-038; H01G009-035; H01M006-16; H01M010-40

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 52

ST methoxyethylphosphazonesulfonylbenzene prepn electrolyte nonaq

secondary battery; phosphazonesulfonyl compd prepn

electrolyte nonaq secondary battery; phosphorus

pentahalide condensation sulfonamide; halophosphazonesulfonyl compd

condensation glycol ether alcoholate

IT Battery electrolytes

(preparation of phosphazonesulfonyl compds. as electrolytes for nonaq. secondary batteries)

IT Phosphazenes

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP

(Preparation)

(preparation of phosphazonesulfonyl compds. as electrolytes for nonaq. secondary batteries)

IT 111-77-3P, Diethylene glycol monomethyl ether 1525-81-1P,

N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene 5666-55-7P,

Trichlorophosphazonesulfonylbenzene 19278-10-5P, Diethylene glycol

monomethyl ether sodium salt 29651-24-9P 377780-52-4P,

N-2,4-Difluorobenzenesulfonyl-P,P,P-trichlorophosphazene

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic

preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of phosphazonesulfonyl compds. as electrolytes for nonaq. secondary batteries)

IT 377780-53-5P 377780-54-6P 377780-55-7P

377780-56-8P

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP

(Preparation)

(preparation of phosphazonesulfonyl compds. as electrolytes for nonaq. secondary batteries)

IT 98-10-2, Benzenesulfonamide 109-86-4, Ethylene glycol monomethyl

ether 402-46-0, 4-Fluorobenzenesulfonamide 3139-99-9, Ethylene

glycol monomethyl ether sodium salt 3144-09-0, Methanesulfonamide

10026-13-8, Phosphorus pentachloride 13656-60-5,

2,4-Difluorobenzenesulfonamide

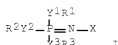
RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of phosphazonesulfonyl compds. as electrolytes for nonaq.

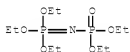
secondary batteries)

L39 ANSWER 12 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2001:833698 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:374116
 TITLE: Secondary nonaqueous electrolyte battery
 INVENTOR(S): Otsuki, Masashi; Endo, Shigeki; Ogino, Takao
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
 SOURCE: PCT Int. Appl., 44 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
WO 2001086746	A1	20011115	WO 2001-JP3788	20010502
W: JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
EP 1289044	A1	20030305	EP 2001-926110	20010502
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
US 20030108801	A1	20030612	US 2002-275008	20021031
US 7229719	B2	20070612		
KR 772496	B1	20071101	KR 2002-714627	20021031
PRIORITY APPLN. INFO.:				
			JP 2000-134683	A 20000508
			JP 2000-134684	A 20000508
			JP 2000-134685	A 20000508
			JP 2000-167468	A 20000605
			WO 2001-JP3788	W 20010502
OTHER SOURCE(S): MARPAT 135:374116				
GI				



- AB The batteries have cathodes, anodes, and a nonaq. electrolyte containing a supporting electrolyte and a phosphazene derivative. The phosphazene derivative is I (R1-3 = monovalent substituents or halogen atom; X = organic groups containing C, Si, Ge, Sn, N, P, As, Sb, Bi, O, S, Se, Te, and/or Po; Y1-3 = bivalent connection units, divalent elements, or single bonds) or (PNR42)n (R4 = monovalent substituent or halogen, n = 3-15).
- IT 2397-48-0
 RL: DEV (Device component use); USES (Uses)
 (comps. of nonaq. electrolyte solns containing phosphazene
 derivs. and lithium salts for secondary lithium batteries
)
- RN 2397-48-0 HCAPLUS
- CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



- IC ICM H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST secondary battery electrolyte phosphazene derive
- IT Battery electrolytes
 (comps. of nonaq. electrolyte solns containing phosphazene derivs.
 and lithium salts for secondary lithium batteries)
- IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate
 623-53-0, Ethyl methyl carbonate 2397-48-0 21324-40-3,
 Lithium hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (comps. of nonaq. electrolyte solns containing phosphazene
 derivs. and lithium salts for secondary lithium batteries
)
- REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L39 ANSWER 13 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:657695 HCAPLUS Full-text

DOCUMENT NUMBER: 135:229350

TITLE: Secondary nonaqueous electrolyte
 batteries

INVENTOR(S): Shiga, Toru; Kawauchi, Shigehiro; Takeichi,
 Kensuke

PATENT ASSIGNEE(S): Toyota Central Research and Development
 Laboratories, Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

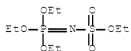
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001243979	A	20010907	JP 2000-51971	20000228
PRIORITY APPLN. INFO.:			JP 2000-51971	20000228

AB The batteries have Li transition metal oxide cathodes, Li intercalating anodes, and a nonaq. electrolyte solution containing a dissolved Li salt; where the electrolyte solution contains a trialkoxyphosphazosulfonyl alkoxide or a mixture containing the alkoxide.

IT 271771-17-6 271771-18-7 271771-19-8
 358750-79-5
 RL: DEV (Device component use); USES (Uses)
 (solvent mixts containing trialkoxyphosphazosulfonyl alkoxide for electrolytes in secondary lithium batteries)

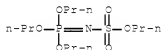
RN 271771-17-6 HCAPLUS

CN Sulfamic acid, N-(triethoxyphosphinylidene)-, ethyl ester (CA INDEX NAME)



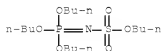
RN 271771-18-7 HCAPLUS

CN Sulfamic acid, N-(tripropoxyphosphinylidene)-, propyl ester (CA INDEX NAME)

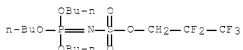


RN 271771-19-8 HCAPLUS

CN Sulfamic acid, N-(tributoxyphosphinylidene)-, butyl ester (CA INDEX NAME)



RN 358750-79-5 HCAPLUS
 CN Sulfamic acid, N-(tributoxyphosphinylidene)-,
 2,2,3,3,3-pentafluoropropyl ester (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery electrolyte solvent
 trialkoxyphosphazosulfonyl alkoxide
 IT Battery electrolytes
 (solvent mixts containing trialkoxyphosphazosulfonyl alkoxide for
 electrolytes in secondary lithium batteries)
 IT 616-38-6, Dimethyl carbonate 21324-40-3, Lithium
 hexafluorophosphate 271771-17-6 271771-18-7
 271771-19-8 358750-79-5
 RL: DEV (Device component use); USES (Uses)
 (solvent mixts containing trialkoxyphosphazosulfonyl alkoxide for
 electrolytes in secondary lithium batteries)

L39 ANSWER 14 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER:

2001:397249 HCAPLUS [Full-text](#)

DOCUMENT NUMBER:

135:7799

TITLE:

Secondary nonaqueous electrolyte
 batteries, deterioration inhibitors for
 the batteries, and additives for the
 battery electrolyte

INVENTOR(S):

Otsuki, Masashi; Endo, Shigeki; Ogino, Takao

PATENT ASSIGNEE(S):

Bridgestone Corporation, Japan

SOURCE:

PCT Int. Appl., 44 pp.

CODEN: PIXXD2

DOCUMENT TYPE:

Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT:

1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039314	A1	20010531	WO 2000-JP8041	20001115
W: KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
JP 2001217001	A	20010810	JP 2000-126568	20000426
JP 2001217002	A	20010810	JP 2000-126569	20000426
JP 2001217003	A	20010810	JP 2000-126570	200004

JP 2001217004	A	20010810	JP 2000-126571	26
				200004
				26
EP 1253662	A1	20021030	EP 2000-976252	200011
				15
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, FI, CY, TR				
US 6955867	B1	20051018	US 2002-130069	200205
				15
KR 775566	B1	20071109	KR 2002-706644	200205
				24
PRIORITY APPLN. INFO.:			JP 1999-334953	A
				199911
				25
			JP 1999-334954	A
				199911
				25
			JP 1999-334955	A
				199911
				25
			JP 1999-334956	A
				199911
				25
			JP 2000-126568	A
				200004
				26
			JP 2000-126569	A
				200004
				26
			JP 2000-126570	A
				200004
				26
			JP 2000-126571	A
				200004
				26
			WO 2000-JP8041	W
				200011
				15

AB The batteries use a nonaq. electrolyte solution containing 2-20 volume% phosphazene derivs. and a supporting electrolyte. The supporting electrolyte is preferably LiPF₆. The deterioration inhibitors and the electrolyte additives are the phosphazene derivs. The batteries are preferably secondary Li batteries.

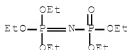
IT 2397-48-0 2397-48-0D, fluorinated
 RL: MOA (Modifier or additive use); USES (Uses)
 (deterioration preventing phosphazene derivs. in
 electrolytes for secondary lithium batteries)

May 24, 2009

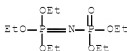
10/540,558

66

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery deterioration inhibitor
phosphazene deriv

IT Battery electrolytes

(electrolytes containing phosphazene derivs. for deterioration
prevention in secondary lithium batteries)

IT Secondary batteries

(lithium; deterioration preventing phosphazene derivs. in
electrolytes for secondary lithium batteries)

IT 2397-48-0 2397-48-0D, fluorinated

RL: MOA (Modifier or additive use); USES (Uses)
(deterioration preventing phosphazene derivs. in
electrolytes for secondary lithium batteries)IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate

105-58-8, Diethyl carbonate 14283-07-9, Lithium fluoroborate

21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(electrolytes containing phosphazene derivs. for deterioration
prevention in secondary lithium batteries)REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L39 ANSWER 15 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:369718 HCAPLUS Full-text

DOCUMENT NUMBER: 134:367047

TITLE: Preparation of sulfonyl-containing phosphazenes
as flame retardants for battery
electrolytesINVENTOR(S): Tsuchiya, Tsubasa; Kawakabe, Hiroshi; Wakui,
Atsushi; Kamata, Tomohisa

PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

May 24, 2009

10/540,558

67

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001139584	A	20010522	JP 1999-325440	19991116
PRIORITY APPLN. INFO.:			JP 1999-325440	19991116

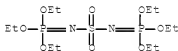
OTHER SOURCE(S): CASREACT 134:367047; MARPAT 134:367047

AB Title compds. (R1O)3P:NSO3R1 or (R2O)3P:NSO2N:P(OR2)3 [R1, R2 = (ether-containing) C1-10 alkyl, haloalkyl] are prepared by reaction of PX5 (X = halo) with sulfamic acid or sulfamide followed by ROM (R = same as R1 or R2; M = alkali metal). PC15 was treated with sulfamic acid in PhCl at 100-105° for 12 h to give 68.8% Cl3P:NSO2Cl, which was treated with diethylene glycol monomethyl ether alcoholate in THF at -22 to -20° for 1 day to give 75.2% (MeOC2H4OC2H4O)3P:NSO3C2H4OC2H4OMe.

IT 72250-12-5P 271771-13-2P 271771-14-3P 271771-15-4P
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)

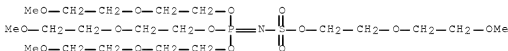
RN 72250-12-5 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexaethyl ester (9CI) (CA INDEX NAME)



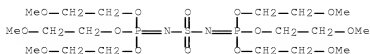
RN 271771-13-2 HCAPLUS

CN Sulfamic acid, N-[tris[2-(2-methoxyethoxy)ethoxy]phosphinylidene]-, 2-(2-methoxyethoxy)ethyl ester (CA INDEX NAME)

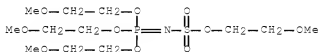


RN 271771-14-3 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



RN 271771-15-4 HCAPLUS

CN Sulfamic acid, N-[tris(2-methoxyethoxy)phosphinylidene]-,
2-methoxyethyl ester (CA INDEX NAME)

IC ICM C07F009-24

ICS C09K021-12

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 52

ST sulfonyl phosphazene prepn flame retardant electrolyte;
battery electrolyte flame retardant phosphazene prepn;
sulfamic acid reaction phosphorus pentahalide alcoholate; sulfamide
reaction phosphorus pentahalide alcoholate

IT Battery electrolytes

Fireproofing agents

(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)

IT Metal alkoxides

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)

IT 109-86-4D, Ethylene glycol monomethyl ether, salts 111-77-3D,

Diethylene glycol monomethyl ether, salts 141-52-6, Sodium

ethoxide 5329-14-6, Sulfamic acid 7803-58-9, Sulfamide

10026-13-8, Phosphorus pentachloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)

IT 14259-65-5P, Bis(trichlorophosphazo) sulfone 14700-21-1P,

Trichlorophosphazosulfonyl chloride

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);

RACT (Reactant or reagent)

(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)

IT 72250-12-5P 271771-13-2P 271771-14-3P

271771-15-4P

RL: SPN (Synthetic preparation); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)

(preparation of sulfonyl-containing phosphazenes as flame retardants for
battery electrolytes)

L39 ANSWER 16 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:101465 HCAPLUS Full-text

DOCUMENT NUMBER: 134:165659

TITLE: Secondary nonaqueous electrolyte

May 24, 2009

10/540,558

69

INVENTOR(S): batteries
 PATENT ASSIGNEE(S): Otsuki, Masahi; Endo, Shigeki; Ogino, Takao
 SOURCE: Bridgestone Corp., Japan
 PCT Int. Appl., 53 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001009973	A1	20010208	WO 2000-JP5053	20000728
W: KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2001102088	A	20010413	JP 2000-126566	20000426
JP 2001217005	A	20010810	JP 2000-128240	20000427
JP 2001217007	A	20010810	JP 2000-128241	20000427
JP 2001217006	A	20010810	JP 2000-128242	20000427
EP 1205997	A1	20020515	EP 2000-949929	20000728
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY				
PRIORITY APPLN. INFO.:			JP 1999-214814	A 19990729
			JP 1999-334957	A 19991125
			JP 1999-334958	A 19991125
			JP 1999-334959	A 19991125
			JP 2000-126566	A 20000426
			JP 2000-128240	A 20000427

JP 2000-128241	A	200004 27
JP 2000-128242	A	200004 27
WO 2000-JP5053	W	200007 28

OTHER SOURCE(S): MARPAT 134:165659
GI

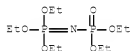


AB The batteries have cathodes, Li intercalating anodes, and a nonaq. electrolyte solution containing Li+ and a phosphazene derivative having flash point $\geq 100^\circ$. Preferably, the phosphazene is I (R1-3 = monovalent substituent or halogen; X = organic group containing C, Si, Ge, Sn, N, P, F, Sb, Bio, O, S, Se, Te, and/or Po; and Y1-3 = single bond, bivalent element or connection group) or (PNR42)n (R4 = monovalent substituent or halogen, n = 3-15).

IT 2397-48-0 324575-25-9
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(phosphazene derivs. with controlled flash point in electrolyte solns. for secondary lithium batteries)

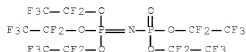
RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



RN 324575-25-9 HCAPLUS

CN Phosphorimidic acid, [bis(pentafluoroethoxy)phosphinyl]-, tris(pentafluoroethyl) ester (9CI) (CA INDEX NAME)



IC H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery electrolyte phosphazene flash point
 IT Battery electrolytes
 (compns. of electrolyte solns. containing phosphazene derivs. with controlled flash point for secondary lithium batteries)
 IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 14283-07-9, Lithium fluoroborate 21324-40-3, Lithium hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (compns. of electrolyte solns. containing phosphazene derivs. with controlled flash point for secondary lithium batteries)
 IT 2397-48-0 324575-25-9
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (phosphazene derivs. with controlled flash point in electrolyte solns. for secondary lithium batteries)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L39 ANSWER 17 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2000:384652 HCAPLUS Full-text
 DOCUMENT NUMBER: 133:20103
 TITLE: Secondary nonaqueous electrolyte batteries
 INVENTOR(S): Tsutiya, Hiromu; Kawakabe, Hiroshi; Wakui, Atsushi; Kamata, Tomohisa; Sam, Huy
 PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan; Sony Corporation
 SOURCE: PCT Int. Appl., 31 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
WO 2000033410	A1	20000608	WO 1999-JP6554	19991124
W: CA, CN, JP, KR, NO, US RW: DE, FI, FR, GB, SE				
CA 2319384	A1	20000608	CA 1999-2319384	19991124
EP 1052720	A1	20001115	EP 1999-973181	19991124
EP 1052720	B1	20080312		
R: DE, FR, GB, SE, FI				
CN 1143406	C	20040324	CN 1999-802470	19991124
TW 437113	B	20010528	TW 1999-88120854	199911

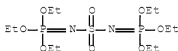
US 6475679	B1	20021105	US 2000-601263	30
				200009
				05
PRIORITY APPLN. INFO.:			JP 1998-338346	A
				199811
				30
			WO 1999-JP6554	W
				199911
				24

AB The batteries have a cathode, a Li⁺ intercalating anode, and a nonaq. Li⁺ electrolyte solution containing phosphazene derivs. (RO)3P:NSO3R' (R and R' are monovalent org groups) and/or (RO)3P:NSO2N:P(OR')3. R and R' are preferably C1-10 alkyl group, which may contain ether group or halogen substituents.

IT 72250-12-5 271771-13-2 271771-14-3
 271771-15-4 271771-16-5 271771-17-6
 271771-18-7 271771-19-8 271771-20-1
 271771-21-2 271771-22-3 271771-23-4
 271771-24-5 271771-25-6 271771-26-7
 271771-27-8
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte solns. containing phosphazene derivs. for
 secondary lithium batteries)

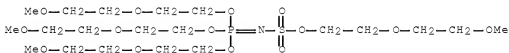
RN 72250-12-5 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexaethyl ester (9CI) (CA INDEX NAME)



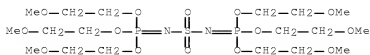
RN 271771-13-2 HCAPLUS

CN Sulfamic acid, N-[tris[2-(2-methoxyethoxy)ethoxy]phosphinylidene]-, 2-(2-methoxyethoxy)ethyl ester (CA INDEX NAME)



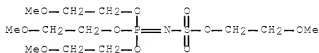
RN 271771-14-3 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



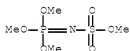
RN 271771-15-4 HCAPLUS

CN Sulfamic acid, N-[tris(2-methoxyethoxy)phosphinyldene]-, 2-methoxyethyl ester (CA INDEX NAME)



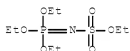
RN 271771-16-5 HCAPLUS

CN Sulfamic acid, N-(trimethoxyphosphinyldene)-, methyl ester (CA INDEX NAME)



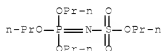
RN 271771-17-6 HCAPLUS

CN Sulfamic acid, N-(triethoxyphosphinyldene)-, ethyl ester (CA INDEX NAME)



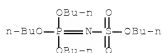
RN 271771-18-7 HCAPLUS

CN Sulfamic acid, N-(tripropoxyphosphinyldene)-, propyl ester (CA INDEX NAME)



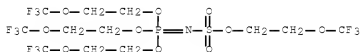
RN 271771-19-8 HCAPLUS

CN Sulfamic acid, N-(tributoxyphosphinyldene)-, butyl ester (CA INDEX NAME)



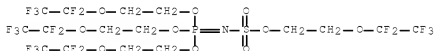
RN 271771-20-1 HCAPLUS

CN Sulfamic acid, N-[tris[2-(trifluoromethoxy)ethoxy]phosphinylidene]-,
2-(trifluoromethoxy)ethyl ester (CA INDEX NAME)



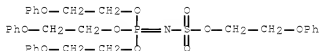
RN 271771-21-2 HCAPLUS

CN Sulfamic acid, N-[tris[2-(1,1,2,2,2-pentafluoroethoxy)ethoxy]phosphinylidene]-, 2-(1,1,2,2,2-pentafluoroethoxy)ethyl ester (CA INDEX NAME)



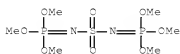
RN 271771-22-3 HCAPLUS

CN Sulfamic acid, N-[tris(2-phenoxyethoxy)phosphinylidene]-,
2-phenoxyethyl ester (CA INDEX NAME)



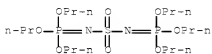
RN 271771-23-4 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexamethyl ester (9CI) (CA INDEX NAME)



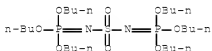
RN 271771-24-5 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexapropyl ester (9CI) (CA INDEX NAME)



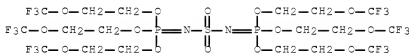
RN 271771-25-6 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexabutyl ester (9CI) (CA INDEX NAME)



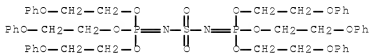
RN 271771-26-7 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis[2-(trifluoromethoxy)ethyl] ester (9CI) (CA INDEX NAME)



RN 271771-27-8 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-phenoxyethyl) ester (9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte phosphazene deriv

IT Battery electrolytes

(electrolyte solns. containing phosphazene derivs. for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(electrolyte solns. containing phosphazene derivs. for secondary lithium batteries)

IT 72250-12-5 271771-13-2 271771-14-3
 271771-15-4 271771-16-5 271771-17-6
 271771-18-7 271771-19-8 271771-20-1
 271771-21-2 271771-22-3 271771-23-4
 271771-24-5 271771-25-6 271771-26-7
 271771-27-8

RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte solns. containing phosphazene derivs. for
 secondary lithium batteries)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L39 ANSWER 18 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2000:67793 HCAPLUS Full-text
 DOCUMENT NUMBER: 132:95813
 TITLE: Secondary lithium batteries
 INVENTOR(S): Shiga, Akira; Aoki, Yoshifumi; Takeichi, Kensuke
 PATENT ASSIGNEE(S): Toyota Central Research and Development
 Laboratories, Inc., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000030740	A	20000128	JP 1998-200672	199807 15
PRIORITY APPLN. INFO.:			JP 1998-200672	199807 15

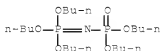
AB The batteries use Li intercalating cathodes, graphitic carbonaceous anodes,
 and a Li salt electrolyte solution; where the electrolyte solution contains
 15-50 volume% ethylene carbonate and 0.5-2.5 volume% phosphazene.

IT 7108-98-7 39528-37-5

RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. with controlled ethylene carbonate
 and phosphazene contents for secondary lithium batteries
)

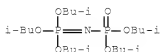
RN 7108-98-7 HCAPLUS

CN Phosphorimidic acid, (dibutoxyphosphinyl)-, tributyl ester (9CI)
 (CA INDEX NAME)



RN 39528-37-5 HCAPLUS

CN Phosphorimidic acid, [bis(2-methylpropoxy)phosphinyl]-,
 tris(2-methylpropyl) ester (9CI) (CA INDEX NAME)

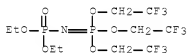


IC ICM H01M010-40
 ICS C07D317-38; C09K021-12
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery electrolyte ethylene carbonate phosphazene
 IT Battery electrolytes
 (electrolyte solns. with controlled ethylene carbonate and
 phosphazene contents for secondary lithium batteries)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 799-83-7
 1065-05-0 7108-98-7 21324-40-3, Lithium
 hexafluorophosphate 26085-02-9D, Polydichlorophosphazene, reaction
 products with sodium ethoxide 39528-37-5
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. with controlled ethylene carbonate
 and phosphazene contents for secondary lithium batteries
)

L39 ANSWER 19 OF 19 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 1994:303349 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 120:303349
 ORIGINAL REFERENCE NO.: 120:53329a,53332a
 TITLE: Nonaqueous electrolyte batteries using
 improved electrolytes
 INVENTOR(S): Kajiware, Naruyuki; Ogino, Takao; Miyazaki,
 Tadaaki; Kawagoe, Takahiro
 PATENT ASSIGNEE(S): Bridgestone Corp, Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06013108	A	19940121	JP 1993-92204	19930326
JP 3055358	B2	20000626		
JP 11144757	A	19990528	JP 1998-219660	19980717
JP 3055536	B2	20000626		
PRIORITY APPLN. INFO.:			JP 1992-115284	A1 19920409
			JP 1993-92204	A3 19930326

- AB In the batteries having cathodes, Li-intercalatable anodes, and Li+-containing nonaq. electrolytes, the electrolytes comprise solns. of phosphazene derivs. having viscosity at 25° of ≤300 cP and dissolving Li salts. The batteries are free from bursting and firing in short circuit, and have high voltage, discharge capacity, etc.
- IT 155270-25-0
RL: USES (Uses)
(electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- RN 155270-25-0 HCAPLUS
- CN Phosphorimidic acid, N-(diethoxyphosphinyl)-, tris(2,2,2-trifluoroethyl) ester (CA INDEX NAME)



- IC ICM H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST battery electrolyte phosphazene deriv safety
- IT Safety
(in batteries, electrolytes containing phosphazene derivs. and lithium salts for)
- IT Battery electrolytes
(lithium salts and phosphazene derivs. in, for safety)
- IT Phosphonitrile compounds
RL: USES (Uses)
(phosphazenes, electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- IT 26085-02-9D, Poly[nitrilo(dichlorophosphoranylidyne)], reaction products with fluorinated and nonfluorinated propanol 26085-02-9D, Poly[nitrilo(dichlorophosphoranylidyne)], reaction products with propanol
RL: USES (Uses)
(cyclic, oligomeric, electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- IT 155270-25-0
RL: USES (Uses)
(electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- IT 7439-93-2D, Lithium, salts 21324-40-3
RL: USES (Uses)
(electrolytes containing phosphazene derivs. and, for batteries, for safety)

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L40 ANSWER 1 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:1334246 HCAPLUS Full-text
DOCUMENT NUMBER: 147:544588
TITLE: Nonaqueous electrolyte containing phosphazene compound and lithium ion secondary battery with high discharge efficiency having the same

May 24, 2009

10/540,558

79

INVENTOR(S): Nakagawa, Hiroe; Katayama, Sadahiro; Nukuta, Toshiyuki
 PATENT ASSIGNEE(S): GS Yuasa Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007305551	A	20071122	JP 2006-135814	20060515
PRIORITY APPLN. INFO.:			JP 2006-135814	20060515

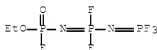
OTHER SOURCE(S): MARPAT 147:544588

AB Disclosed is a nonaq. electrolyte made from an organic material consisting of a lithium salt, and a salt at molten state at room temperature containing a (cyclic) phosphazene compound and a quaternary ammonium organic cation.

IT 850650-07-6
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

RN 850650-07-6 HCAPLUS

CN Phosphoramidofluoridic acid,
 N-[difluoro(trifluorophosphoranylidene)amino]phosphoranylidene]-,
 ethyl ester (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte cyclic phosphazene compd lithium ion secondary battery; quaternary ammonium org cation

IT Secondary batteries
 (lithium; nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

IT Battery electrolytes
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

IT Quaternary ammonium compounds, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

IT 33027-66-6 90076-65-6, LiTFSi 132843-44-8, Lithium
 bis(perfluoroethanesulfonyl)imide 143314-16-3,
 1-Ethyl-3-methylimidazolium tetrafluoroborate 174501-64-5,
 1-Butyl-3-methylimidazolium hexafluorophosphate 174501-65-6,

1-n-Butyl-3-methylimidazolium tetrafluoroborate 850650-07-6
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte containing phosphazene compound for
 lithium ion secondary battery with high discharge
 efficiency)

L40 ANSWER 2 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2007:910885 HCAPLUS Full-text
 DOCUMENT NUMBER: 147:238866
 TITLE: Nonaqueous electrolyte lithium secondary
 batteries
 INVENTOR(S): Matsuda, Hiroaki; Yoshizawa, Hiroshi
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 13pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2007207455	A	20070816	JP 2006-21897	200601 31
PRIORITY APPLN. INFO.:			JP 2006-21897	200601 31

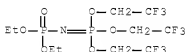
AB The battery includes anode, containing active materials alloying with Li, e.g. Si and/or Sn, catalyst elements for growing carbon nanofibers, and composite particles including carbon nanofibers grown on active material surfaces, and nonaq. electrolytes, containing ≥ 1 of phosphazenes and phosphoric acid esters. The batteries have excellent high-temperature storage stability.

IT 155270-25-0

RL: MOA (Modifier or additive use); USES (Uses)
 (anode active materials containing; nonaq. electrolyte
 lithium secondary batteries with anodes containing carbon
 nanofiber-grown active material particles and phosphazenes or
 phosphate esters)

RN 155270-25-0 HCAPLUS

CN Phosphorimidic acid, N-(diethoxyphosphinyl)-,
 tris(2,2,2-trifluoroethyl) ester (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq electrolyte lithium battery high temp storage
 stability; carbon nanofiber nonaq battery anode; phosphate
 ester nonaq battery anode; anode nonaq battery
 phosphazene additive
 IT Phosphates, uses

- Phosphazenes
RL: MOA (Modifier or additive use); USES (Uses)
(anode active materials containing; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT Nanofibers
(carbon; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT Secondary batteries
(lithium; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nanofiber; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT Battery anodes
Battery electrolytes
(nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT 12039-83-7, Titanium silicide (TiSi2)
RL: TEM (Technical or engineered material use); USES (Uses)
(Ti-Si alloy anode active materials containing; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT 512-56-1, Trimethyl phosphate 1065-05-0 2196-04-5, Ethylene methyl phosphate 155270-25-0
RL: MOA (Modifier or additive use); USES (Uses)
(anode active materials containing; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT 7440-21-3, Silicon, uses 18282-10-5, Tin oxide (SnO2) 56728-61-1 113443-18-8, Silicon oxide (SiO)
RL: TEM (Technical or engineered material use); USES (Uses)
(anode active materials; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 277299-63-5, Sol-Rite
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte; nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)
- IT 10141-05-6, Cobalt nitrate 13138-45-9, Nickel nitrate 21324-40-3, Lithium hexafluorophosphate
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. electrolyte lithium secondary batteries with anodes containing carbon nanofiber-grown active material particles and phosphazenes or phosphate esters)

TITLE: Nonaqueous electrolyte solution with high safety, evaluation of its safety, and batteries and electric double-layer capacitors using it

INVENTOR(S): Eguchi, Shinichi

PATENT ASSIGNEE(S): Bridgestone Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 30pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006294334	A	20061026	JP 2005-110883	20050407
PRIORITY APPLN. INFO.:			JP 2005-110883	20050407

OTHER SOURCE(S): MARPAT 145:457670

AB The disclosed solution is characterized by having maximum heat generation rate ≤ 550 kW/m² or total heat generation ≤ 10 MJ/m² when measured by a cone calorimeter. Preferably, the solution contains cyclic phosphazene compds. represented by (NPR₁₂)_n (R₁ = halo, monovalent substituent; n = 3-4), fluorophosphates represented by O:PF₂ (R₂ = halo, alkoxy, aryloxy; at least one of R₂ is alkoxy or aryloxy), and supporting electrolytes, or the solution comprises solvents composed of only phosphate derivs. and supporting electrolytes. Safety of the solution is evaluated by measuring its maximum heat generation rate or total heat generation by using a cone calorimeter. Secondary nonaq. electrolyte batteries and nonaq. electrolyte elec. double-layer capacitors using the solution are also claimed. Explosion or ignition of the batteries and the capacitors are suppressed.

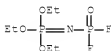
IT 913182-28-2

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(nonaq. electrolyte solution with low heat generation, preferably containing phosphazene and phosphate, for high safety for batteries and elec. double-layer capacitors)

RN 913182-28-2 HCAPLUS

CN Phosphorimidic acid, (difluorophosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76

ST nonaq electrolyte soln safety phosphazene phosphate; safety evaluation nonaq electrolyte soln heat generation cone calorimeter; battery elec double layer capacitor nonaq electrolyte soln

IT Capacitors
 (double layer; nonaq. electrolyte solution with low heat generation, preferably containing phosphazene and phosphate, for high safety for batteries and elec. double-layer capacitors)

IT Secondary batteries
 (nonaq. electrolyte solution with low heat generation, preferably containing phosphazene and phosphate, for high safety for batteries and elec. double-layer capacitors)

IT Electrolytic solutions
 (nonaq.; nonaq. electrolyte solution with low heat generation, preferably containing phosphazene and phosphate, for high safety for batteries and elec. double-layer capacitors)

IT 78-40-0, Triethyl phosphate 358-74-7, Diethyl fluorophosphate 460-52-6, Ethyl difluorophosphate 512-56-1, Trimethyl phosphate 1126-52-9 5954-50-7, Dimethyl fluorophosphate 14700-00-6 15391-51-2, Phosphoramidic difluoride 22382-13-4, Methyl difluorophosphate 26078-16-0 26471-90-9 33027-66-6 33027-68-8 55593-36-7 607744-75-2 882692-99-1 913182-28-2

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte solution with low heat generation, preferably containing phosphazene and phosphate, for high safety for batteries and elec. double-layer capacitors)

L40 ANSWER 4 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2006:1122518 HCAPLUS Full-text

DOCUMENT NUMBER: 145:457669

TITLE: Nonaqueous electrolyte solution with high safety, evaluation of its safety, and batteries and electric double-layer capacitors using it

INVENTOR(S): Eguchi, Shinichi

PATENT ASSIGNEE(S): Bridgestone Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 30pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

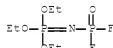
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006294332	A	20061026	JP 2005-110865	20050407
PRIORITY APPLN. INFO.:			JP 2005-110865	20050407

OTHER SOURCE(S): MARPAT 145:457669

AB The disclosed solution is characterized by having flame temperature $\leq 2700^{\circ}$ when a flame at $700-800^{\circ}$ is brought in contact with the solution. Preferably, the solution contains cyclic phosphazene compds. represented by (NPR₁₂)_n (R₁ = halo, monovalent substituent; n = 3-4), fluorophosphates represented by O:PF₂R₂ (R₂ = halo, alkoxy, aryloxy; at least one of R₂ is alkoxy or aryloxy), and supporting electrolytes. Safety of the solution is evaluated by measuring its flame temperature by bringing a flame at $700-800^{\circ}$ in contact with the solution. Secondary nonaq. electrolyte batteries and nonaq. electrolyte elec. double-

layer capacitors using the solution are also claimed. Explosion or ignition of the batteries and the capacitors are suppressed.

- IT 913182-28-2
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- RN 913182-28-2 HCAPLUS
- CN Phosphorimidic acid, (difluorophosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76
- ST nonaq electrolyte soln safety phosphazene phosphate; safety evaluation nonaq electrolyte soln flame temp; battery elec double layer capacitor nonaq electrolyte soln
- IT Capacitors
 (double layer; nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- IT Secondary batteries
 (nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- IT Electrolytic solutions
 (nonaq.; nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)
- IT 78-40-0, Triethyl phosphate 358-74-7, Diethyl fluorophosphate 460-52-6, Ethyl difluorophosphate 512-56-1, Trimethyl phosphate 1126-52-9 5954-50-7, Dimethyl fluorophosphate 14700-00-6 15391-51-2, Phosphoramidic difluoride 22382-13-4, Methyl difluorophosphate 26078-16-0 26471-90-9 33027-66-6 33027-68-8 55593-36-7 607744-75-2 882692-99-1 913182-28-2
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte solution with low flame temperature containing phosphazene and phosphate for high safety for batteries and elec. double-layer capacitors)

L40 ANSWER 5 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:368511 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 142:433056

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Koto, Tomoko

PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

May 24, 2009

10/540,558

85

LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

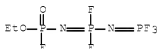
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005116306	A	20050428	JP 2003-348133	20031007
PRIORITY APPLN. INFO.:			JP 2003-348133	20031007

AB The battery has a cathode, containing a Li-Ni-Mn composite oxide : $\text{Li}_x\text{Ni}_y\text{Mn}_{2-y}\text{O}_{4-\delta}$ ($0 < x < 1.1$; $0.45 < y < 0.55$; and $0 \leq \delta < 0.4$) as a cathode active mass, an anode, and a nonaq. electrolyte solution; where the electrolyte solution contains 0.1-20 mass%. phosphazene derivative

IT 850650-07-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

RN 850650-07-6 HCAPLUS

CN Phosphoramidofluoridic acid,
 N-[difluoro(trifluorophosphoranylidene)amino]phosphoranylidene]-, ethyl ester (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery cathode lithium manganese nickel oxide; battery electrolyte phosphazene deriv

IT Battery cathodes
 Battery electrolytes
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT Polyphosphazenes
 RL: MOA (Modifier or additive use); USES (Uses)
 (cyclic; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT Secondary batteries
 (lithium; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
 7782-42-5, Graphite, uses 12031-75-3, Lithium manganese nickel

oxide (LiMn_{1.5}Ni_{0.5}O₄) 14283-07-9, Lithium tetrafluoroborate
 21324-40-3, Lithium hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and electrolytes
 containing phosphazene derivs. for secondary lithium
 batteries)

IT 850650-07-6

RL: MOA (Modifier or additive use); USES (Uses)
 (cathodes containing lithium manganese nickel oxides and
 electrolytes containing phosphazene derivs. for secondary
 lithium batteries)

L40 ANSWER 6 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:570217 HCAPLUS Full-text

DOCUMENT NUMBER: 141:126304

TITLE: Additive for secondary battery
 nonaqueous electrolyte solution and the
 battery

INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004059782	A1	20040715	WO 2003-JP16592	20031224
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2003292764	A1	20040722	AU 2003-292764	20031224
EP 1580832	A1	20050928	EP 2003-768180	20031224
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
CN 1732588	A	20060208	CN 2003-80107739	20031224
CN 100362689	C	20080116		
US 20060046151	A1	20060302	US 2005-540558	200506

PRIORITY APPLN. INFO.:	JP 2002-377142	A	24
			200212
			26
	WO 2003-JP16592	W	
			200312
			24

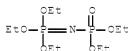
AB The additive comprises a phosphazene derivative represented by $R_13P = N-X$ (R_1 = halo or monovalent substituent; and $X = C, Si, N, P, O$ and/or S containing organic group). The battery has a nonaq. electrolyte solution comprising the above additive, a cathode, and an anode.

IT 2397-48-0 722454-84-4 722454-85-5
722454-86-6

RL: MOA (Modifier or additive use); USES (Uses)
(additives containing phosphazene derivs. for secondary
battery electrolytes)

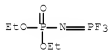
RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



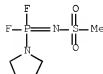
RN 722454-84-4 HCAPLUS

CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester
(9CI) (CA INDEX NAME)



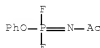
RN 722454-85-5 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-
(9CI) (CA INDEX NAME)



RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA
INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery nonaq electrolyte additive
 phosphazene deriv
 IT Battery electrolytes
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT Secondary batteries
 (lithium; additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium
 hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 IT 2397-48-0 722454-84-4 722454-85-5
 722454-86-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives containing phosphazene derivs. for secondary
 battery electrolytes)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L40 ANSWER 7 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2003:377216 HCAPLUS Full-text
 DOCUMENT NUMBER: 138:371761
 TITLE: Primary nonaqueous electrolyte battery
 and additive for the battery
 electrolyte
 INVENTOR(S): Otsuki, Masashi; Eguchi, Shinichi; Kanno, Yushi
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
 SOURCE: PCT Int. Appl., 101 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003041197	A1	20030515	WO 2002-JP11173	200210 28
W: CA, JP, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
CA 2465845	A1	20030515	CA 2002-2465845	200210 28

EP 1443578

A1

20040804

EP 2002-775406

200210
28R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
PT, IE, FI, CY, TR, BG, CZ, EE, SK

US 20050123836

A1

20050609

US 2004-494936

200405
07

PRIORITY APPLN. INFO.:

JP 2001-341464

A

200111
07

JP 2001-371305

A

200112
05

JP 2001-371356

A

200112
05

JP 2001-371378

A

200112
05

JP 2001-371499

A

200112
05

WO 2002-JP11173

W

200210
28OTHER SOURCE(S):
GI

MARPAT 138:371761



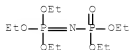
AB The battery uses a nonaq. electrolyte solution containing a supporting salt and a phosphazene derivative additive having viscosity ≤ 100 cP at 25°. The electrolyte solution may contain an aprotic solvent. The additive is preferably I (R1-3 = monovalent substituent or halogen, X1 = organic group containing C, Si, Ge, Sn, N, P, As, Sb, Bi, O, S, Se, Te, and/or Po), Y1-3 = linking group, bond, element or II (R4 = monovalent substituent or halogen, and may differ from each, n = 3-15).

IT 2397-48-0 97682-87-6 324575-25-9
524699-03-4

RL: MOA (Modifier or additive use); USES (Uses)
(phosphazene derivative additives in electrolytes for
primary lithium batteries)

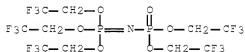
RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



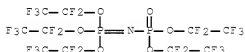
RN 97682-87-6 HCAPLUS

CN Phosphorimidic acid, [bis(2,2,2-trifluoroethoxy)phosphinyl]-, tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)



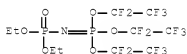
RN 324575-25-9 HCAPLUS

CN Phosphorimidic acid, [bis(pentafluoroethoxy)phosphinyl]-, tris(pentafluoroethyl) ester (9CI) (CA INDEX NAME)



RN 524699-03-4 HCAPLUS

CN Phosphorimidic acid, [diethoxyphosphinyl]-, tris(pentafluoroethyl) ester (9CI) (CA INDEX NAME)



IC ICM H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST primary nonaq battery electrolyte soln phosphazene additive

IT Battery electrolytes

(phosphazene derivative additives in electrolytes for primary lithium batteries)

IT 96-48-0, γ -Butyrolactone 108-32-7, Propylene carbonate

616-38-6, Dimethyl carbonate 90076-65-6

RL: DEV (Device component use); USES (Uses)

(phosphazene derivative additives in electrolytes for primary lithium batteries)

IT 2397-48-0 3654-42-0 28655-96-1,

Poly[nitrilo(difluorophosphoranylidene)] 28655-96-1D,

Poly[nitrilo(difluorophosphoranylidene)], alkyl alkoxy or Ph

substituted, fluoro derivs. 97682-87-6 324575-25-9
524699-03-4

RL: MOA (Modifier or additive use); USES (Uses)
(phosphazene derivative additives in electrolytes for
primary lithium batteries)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L40 ANSWER 8 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:42601 HCAPLUS Full-text

DOCUMENT NUMBER: 138:92872

TITLE: Polymer electrolyte and polymer electrolyte
battery

INVENTOR(S): Otsuki, Masashi; Endo, Shigeki; Ogino, Takao

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003005478	A1	20030116	WO 2002-JP6570	20020628
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CA 2451790	A1	20030116	CA 2002-2451790	20020628
AU 2002313296	A1	20030121	AU 2002-313296	20020628
EP 1414096	A1	20040428	EP 2002-738860	20020628
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR			
CN 1522477	A	20040818	CN 2002-813412	20020628
CN 100413140	C	20080820		
CN 1697243	A	20051116	CN 2005-10079713	20020628
CN 100377415	C	20080326		
US 20040192853	A1	20040930	US 2004-482804	200401

PRIORITY APPLN. INFO.:	JP 2001-204415	A	05 200107 05
	JP 2001-206763	A	200107 06
	JP 2001-242051	A	200108 09
	JP 2001-327618	A	200110 25
	JP 2001-207705	A	200107 09
	JP 2001-207706	A	200107 09
	JP 2001-242067	A	200108 09
	CN 2002-813411	A3	200206 28
	WO 2002-JP6570	W	200206 28

OTHER SOURCE(S): MARPAT 138:92872
GI



AB The battery has a cathode, an anode, and an electrolyte mixture, containing a supporting electrolyte and a polymer containing a phosphazene derivative. The phosphazene derivative is I (R1-3 = halogen or monovalent substituents, X = C, Si, Ge, Sn, N, As, Sb, Bi, O, S, Se, Te, Po or groups containing ≥ 1 of these elements, Y1-3 = bivalent connection groups or elements or a single bond) or II (R4 = halogen or monovalent substituent, n = 3-14).

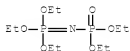
IT 2397-48-0

RL: DEV (Device component use); USES (Uses)
(polymer electrolytes containing supporting

electrolytes and phosphazene derivs. for secondary
lithium batteries)

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery polymer electrolyte phosphazene deriv

IT Battery electrolytes

(polymer electrolytes containing supporting electrolytes and
phosphazene derivs. for secondary lithium batteries)

IT Phosphazenes

Polyoxyalkylenes, uses

RL: DEV (Device component use); USES (Uses)

(polymer electrolytes containing supporting electrolytes and
phosphazene derivs. for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
2397-48-0 21324-40-3, Lithium hexafluorophosphate
25322-68-3, Poly(ethylene oxide) 33027-66-6 471894-05-0
485399-26-6 485399-27-7

RL: DEV (Device component use); USES (Uses)

(polymer electrolytes containing supporting
electrolytes and phosphazene derivs. for secondary
lithium batteries)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L40 ANSWER 9 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2002:185512 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:219552

TITLE: Additive for secondary nonaqueous electrolyte
battery and double layer capacitor

INVENTOR(S): Otsuki, Masashi; Endo, Shigeki; Ogino, Takao

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 47 pp.

CODEN: FIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

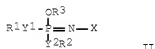
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002021630	A1	20020314	WO 2001-JP7691	20010905

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,

LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
 NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
 TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
 TD, TG

AU 2001084431 A 20020322 AU 2001-84431 200109
 05
 CA 2422108 A1 20030307 CA 2001-2422108 200109
 05
 EP 1328036 A1 20030716 EP 2001-963432 200109
 05
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
 CN 1219338 C 20050914 CN 2001-815211 200109
 05
 US 20030175597 A1 20030918 US 2003-363172 200303
 31
 US 7067219 B2 20060627
 PRIORITY APPLN. INFO.: JP 2000-272084 A 200009
 07
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 WO 2001-JP7691 W 200109
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 OTHER SOURCE(S): MARPAT 136:219552
 GI



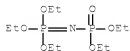
AB The additive contains phosphazene derivs. I or II, where R1-3 = monovalent substituent or halogen atom; X = substituent containing C, Si, Ge, Sn, N, P, As, Sb, Bi, O, S, Se, Te, and/or Po; and Y1 and Y2 = bivalent connecting group, bivalent element, or single bond.

IT 2397-48-0
 RL: MOA (Modifier or additive use); USES (Uses)
 (phosphazene derivative additives in nonaq. electrolytes
 for secondary lithium batteries and double layer
 capacitors)

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)

(CA INDEX NAME)



IC ICM H01M010-40
ICS H01M006-16; H01G009-038

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76

ST secondary battery nonaq electrolyte phosphazene deriv
additive; double layer capacitor electrolyte phosphazene deriv
additive

IT Battery electrolytes
(electrolytes containing phosphazene derivative additives for secondary
lithium batteries)

IT Phosphazenes
RL: MOA (Modifier or additive use); USES (Uses)
(phosphazene derivative additives in nonaq. electrolytes for
secondary lithium batteries and double layer
capacitors)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
14283-07-9, Lithium fluoroborate 21324-40-3, Lithium
hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(electrolytes containing phosphazene derivative additives for secondary
lithium batteries)

IT 2397-48-0 3654-42-0
RL: MOA (Modifier or additive use); USES (Uses)
(phosphazene derivative additives in nonaq. electrolytes
for secondary lithium batteries and double layer
capacitors)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L40 ANSWER 10 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:881968 HCAPLUS Full-text

DOCUMENT NUMBER: 136:21960

TITLE: Nonaqueous electrolyte battery

INVENTOR(S): Kikuchi, Masahiro; Yonekawa, Fumihiro; Wakui,
Atsushi; Kamata, Tomohisa

PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001338683	A	20011207	JP 2000-157055	200005 26

PRIORITY APPLN. INFO.:

JP 2000-157055

200005

26

OTHER SOURCE(S): MARPAT 136;21960

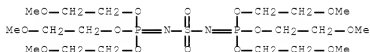
AB The battery has a Li intercalating spinel type Li Mn oxide cathode, a Li intercalating anode, and nonaq. Li ion electrolyte solution containing a Mn dissoln. inhibitor, which is a phosphazene derivative selected from (R0)3P:NSO3R1 (R and R1 = monovalent organic group) and (R2O)3P:NSO2N:P(OR3)3 (R2 and R3 = monovalent organic group).

IT 271771-14-3 271771-15-4

RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

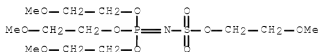
RN 271771-14-3 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-methoxyethyl) ester
(9CI) (CA INDEX NAME)



RN 271771-15-4 HCAPLUS

CN Sulfamic acid, N-[tris(2-methoxyethoxy)phosphinylidene]-,
2-methoxyethyl ester (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte manganese dissoln

inhibitor phosphazene

IT Battery cathodes

Battery electrolytes

(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

IT Secondary batteries

(lithium; electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

12057-17-9, Lithium manganese oxide (LiMn2O4) 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

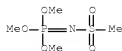
(electrolyte solns. containing phosphazene derivs. for preventing manganese dissoln. from cathodes in secondary lithium

batteries)
 IT 271771-14-3 271771-15-4
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte solns. containing phosphazene derivs. for
 preventing manganese dissoln. from cathodes in secondary lithium
 batteries)
 IT 7439-96-5, Manganese, miscellaneous
 RL: MSC (Miscellaneous)
 (electrolyte solns. containing phosphazene derivs. for preventing
 manganese dissoln. from cathodes in secondary lithium
 batteries)

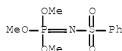
L40 ANSWER 11 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2001:881967 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:21959
 TITLE: Nonaqueous electrolyte battery
 INVENTOR(S): Fui, Samu; Narita, Yukio; Saito, Tadashi; Ohara,
 Nobuhiko; Wakui, Atsushi; Kamata, Tomohisa
 PATENT ASSIGNEE(S): Sony Corp., Japan; Nippon Chemical Industrial
 Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001338682	A	20011207	JP 2000-157054	200005 26
PRIORITY APPLN. INFO.:			JP 2000-157054	200005 26

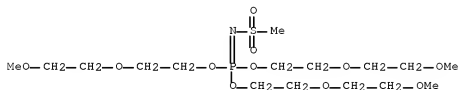
OTHER SOURCE(S): MARPAT 136:21959
 AB The battery has a cathode, a Li intercalating anode, and a nonaq. Li+
 electrolyte solution containing a phosphazene derivative (RO)3P:NSO2R', where
 R = (halogenated) C1-10 (branched) alkyl or (halogenated) Me(OCH2CH2)n- (n =
 1-5), and R' = (halogenated) C1-12 alkyl or Ph group that may have halogen,
 alkoxy, and/or C1-4 alkyl substituents.
 IT 7109-06-0 62461-25-0 377780-53-5
 377780-54-6 377780-55-7 377780-56-8
 378795-41-6 378795-42-7 378795-43-8
 378795-44-9 378795-45-0 378795-46-1
 378795-47-2 378795-48-3 378795-49-4
 378795-50-7
 RL: MOA (Modifier or additive use); USES (Uses)
 (solvent mixts. containing phosphazene derives for
 electrolyte solns. in secondary lithium batteries
)
 RN 7109-06-0 HCAPLUS
 CN Phosphorimidic acid, (methylsulfonyl)-, trimethyl ester (7CI, 8CI,
 9CI) (CA INDEX NAME)



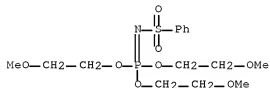
RN 62461-25-0 HCAPLUS

CN Phosphorimidic acid, (phenylsulfonyl)-, trimethyl ester (6CI, 9CI)
(CA INDEX NAME)

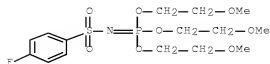
RN 377780-53-5 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-,
tris[2-(2-methoxyethoxy)ethyl] ester (9CI) (CA INDEX NAME)

RN 377780-54-6 HCAPLUS

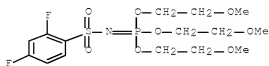
CN Phosphorimidic acid, (phenylsulfonyl)-, tris(2-methoxyethyl) ester
(9CI) (CA INDEX NAME)

RN 377780-55-7 HCAPLUS

CN Phosphorimidic acid, [(4-fluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

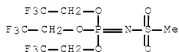
RN 377780-56-8 HCAPLUS

CN Phosphorimidic acid, [(2,4-difluorophenyl)sulfonyl]-, tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



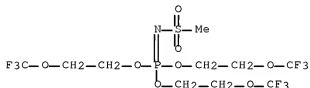
RN 378795-41-6 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)



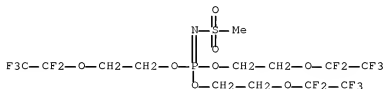
RN 378795-42-7 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris[2-(trifluoromethoxy)ethyl] ester (9CI) (CA INDEX NAME)



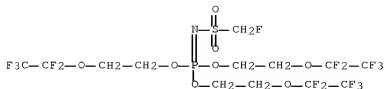
RN 378795-43-8 HCAPLUS

CN Phosphorimidic acid, (methylsulfonyl)-, tris[2-(pentafluoroethoxy)ethyl] ester (9CI) (CA INDEX NAME)

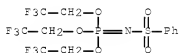


RN 378795-44-9 HCAPLUS

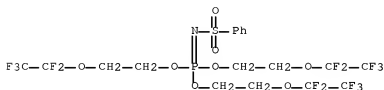
CN Phosphorimidic acid, [(fluoromethyl)sulfonyl]-, tris[2-(pentafluoroethoxy)ethyl] ester (9CI) (CA INDEX NAME)



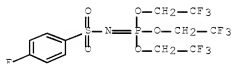
RN 378795-45-0 HCAPLUS

CN Phosphorimidic acid, (phenylsulfonyl)-, tris(2,2,2-trifluoroethyl)
ester (9CI) (CA INDEX NAME)

RN 378795-46-1 HCAPLUS

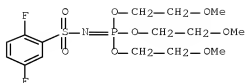
CN Phosphorimidic acid, (phenylsulfonyl)-,
tris[2-(pentafluoroethoxy)ethyl] ester (9CI) (CA INDEX NAME)

RN 378795-47-2 HCAPLUS

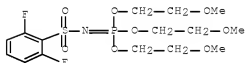
CN Phosphorimidic acid, [(4-fluorophenyl)sulfonyl]-,
tris(2,2,2-trifluoroethyl) ester (9CI) (CA INDEX NAME)

RN 378795-48-3 HCAPLUS

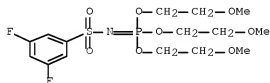
CN Phosphorimidic acid, [(2,5-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



RN 378795-49-4 HCAPLUS

CN Phosphorimidic acid, [(2,6-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

RN 378795-50-7 HCAPLUS

CN Phosphorimidic acid, [(3,5-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte phosphazene deriv

IT Battery electrolytes

(solvent mixts. containing phosphazene derives for electrolyte solns.
in secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

RL: DEV (Device component use); USES (Uses)

(solvent mixts. containing phosphazene derives for electrolyte solns.
in secondary lithium batteries)

IT 7109-06-0 62461-25-0 377780-53-5

377780-54-6 377780-55-7 377780-56-8

378795-41-6 378795-42-7 378795-43-8

378795-44-9 378795-45-0 378795-46-1

378795-47-2 378795-48-3 378795-49-4

378795-50-7

RL: MOA (Modifier or additive use); USES (Uses)

(solvent mixts. containing phosphazene derives for
electrolyte solns. in secondary lithium batteries
)

L40 ANSWER 12 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:873246 HCAPLUS Full-text

DOCUMENT NUMBER: 136:20156
 TITLE: Preparation of sulfonyl-containing phosphazenes
 INVENTOR(S): Narita, Yukio; Saito, Tadashi; Ohara, Nobuhiko;
 Wakui, Atsushi; Kamata, Tomohisa
 PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001335590	A	20011204	JP 2000-157053	20000526
PRIORITY APPLN. INFO.:				20000526

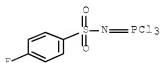
OTHER SOURCE(S): CASREACT 136:20156; MARPAT 136:20156

AB The title (R1O)3P:NSO2R2 [R1 = (CH2CH2O)nMe which may be substituted with halo (n = 1-5); R2 = C1-12 (halo)alkyl, (halo)phenyl, C1-4 alkyl-(halo)phenyl] (I), useful as electrolytes for nonaq. secondary batteries, flame retardants for lubricants, etc., are prepared by treating phosphorus pentahalides with H2NSO2R2 (R2 = same as above) and then treating the resulting X3P:NSO2R2 (R2 = same as above; X = halo) (II) with RIOM (R1 = same as above; M = alkali metal). E.g., a mixture of PCl5, PhSO2NH2, toluene, and THF was stirred at room temperature for 2.5 h to give 96.9% II (R2 = Ph, X = Cl) (III). An alcoholate solution, prepared from MeOCH2CH2OH and NaH in THF, was added dropwise to a mixture of III and toluene at 0-10° and then the reaction mixture was stirred at room temperature for 3.5 h to give 78.4% I (R1 = CH2CH2OMe, R2 = Ph).

IT 1525-81-1P, N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene 5666-55-7P, Trichlorophosphazosulfonylbenzene 29651-24-9P 377780-52-4P, N-2,4-Difluorobenzenesulfonyl-P,P,P-trichlorophosphazene
 RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (preparation of phosphazosulfonyl compds. as electrolytes for nonaq. secondary batteries)

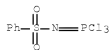
RN 1525-81-1 HCAPLUS

CN Benzenesulfonamide, 4-fluoro-N-(trichlorophosphoranylidene)- (CA INDEX NAME)



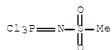
RN 5666-55-7 HCAPLUS

CN Benzenesulfonamide, N-(trichlorophosphoranylidene)- (CA INDEX NAME)

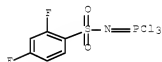


RN 29651-24-9 HCAPLUS

CN Methanesulfonamide, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 377780-52-4 HCAPLUS

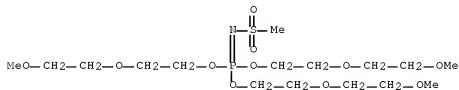
CN Benzenesulfonamide, 2,4-difluoro-N-(trichlorophosphoranylidene)-
(CA INDEX NAME)

IT 377780-53-5P 377780-54-6P 377780-55-7P

377780-56-8P

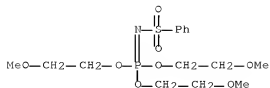
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
(Preparation)
(preparation of phosphazosulfonyl compds. as electrolytes
for nonaq. secondary batteries)

RN 377780-53-5 HCAPLUS

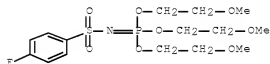
CN Phosphorimidic acid, (methylsulfonyl)-,
tris[2-(2-methoxyethoxy)ethyl] ester (9CI) (CA INDEX NAME)

RN 377780-54-6 HCAPLUS

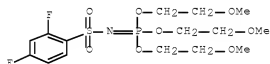
CN Phosphorimidic acid, (phenylsulfonyl)-, tris(2-methoxyethyl) ester
(9CI) (CA INDEX NAME)



RN 377780-55-7 HCAPLUS

CN Phosphorimidic acid, [(4-fluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

RN 377780-56-8 HCAPLUS

CN Phosphorimidic acid, [(2,4-difluorophenyl)sulfonyl]-,
tris(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

IC ICM C07F009-24

ICS H01G009-038; H01G009-035; H01M006-16; H01M010-40

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 52

ST methoxyethylphosphazosulfonylbenzene prepn electrolyte nonaq

secondary battery; phosphazosulfonyl compd prepn

electrolyte nonaq secondary battery; phosphorus

pentahalide condensation sulfonamide; halophosphazosulfonyl compd

condensation glycol ether alcoholate

IT Battery electrolytes

(preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
secondary batteries)

IT Phosphazenes

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
(Preparation)(preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
secondary batteries)

IT 111-77-3P, Diethylene glycol monomethyl ether 1525-81-1P,

N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene

5666-55-7P, Trichlorophosphazosulfonylbenzene 19278-10-5P,

Diethylene glycol monomethyl ether sodium salt 29651-24-9P

377780-52-4P, N-2,4-Difluorobenzenesulfonyl-P,P,P-

trichlorophosphazene

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic
preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of phosphazosulfonyl compds. as electrolytes)

for nonaq. secondary batteries)
 IT 377780-53-5P 377780-54-6P 377780-55-7P
 377780-56-8P
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)
 (preparation of phosphazosulfonyl compds. as electrolytes
 for nonaq. secondary batteries)
 IT 98-10-2, Benzenesulfonamide 109-86-4, Ethylene glycol monomethyl
 ether 402-46-0, 4-Fluorobenzenesulfonamide 3139-99-9, Ethylene
 glycol monomethyl ether sodium salt 3144-09-0, Methanesulfonamide
 10026-13-8, Phosphorus pentachloride 13656-60-5,
 2,4-Difluorobenzenesulfonamide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of phosphazosulfonyl compds. as electrolytes for nonaq.
 secondary batteries)

L40 ANSWER 13 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2001:833698 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:374116
 TITLE: Secondary nonaqueous electrolyte battery
 INVENTOR(S): Otsuki, Masashi; Endo, Shigeki; Ogino, Takao
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan
 SOURCE: PCT Int. Appl., 44 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001086746	A1	20011115	WO 2001-JP3788	200105 02
W: JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
EP 1289044	A1	20030305	EP 2001-926110	200105 02
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
US 20030108801	A1	20030612	US 2002-275008	200210 31
US 7229719	B2	20070612		200210 31
KR 772496	B1	20071101	KR 2002-714627	200005 08
PRIORITY APPLN. INFO.:				200005 08
JP 2000-134683				A
JP 2000-134684				A
JP 2000-134685				A
				200005 08

08

JP 2000-167468

A

200006
05

WO 2001-JP3788

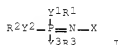
W

200105
02

OTHER SOURCE(S):

MARPAT 135:374116

GI



AB The batteries have cathodes, anodes, and a nonaq. electrolyte containing a supporting electrolyte and a phosphazene derivative The phosphazene derivative is I (R1-3 = monovalent substituents or halogen atom; X = organic groups containing C, Si, Ge, Sn, N, P, As, Sb, Bi, O, S, Se, Te, and/or Po; Y1-3 = bivalent connection units, divalent elements, or single bonds) or (PNR42)n (R4 = monovalent substituent or halogen, n = 3-15).

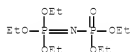
IT 2397-48-0

RL: DEV (Device component use); USES (Uses)

(comps. of nonaq. electrolyte solns containing phosphazene
derivs. and lithium salts for secondary lithium batteries
)

RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery electrolyte phosphazene derive

IT Battery electrolytes

(comps. of nonaq. electrolyte solns containing phosphazene derivs.
and lithium salts for secondary lithium batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate
623-53-0, Ethyl methyl carbonate 2397-48-0 21324-40-3,
Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(comps. of nonaq. electrolyte solns containing phosphazene
derivs. and lithium salts for secondary lithium batteries
)

REFERENCE COUNT:

5

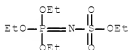
THERE ARE 5 CITED REFERENCES AVAILABLE FOR

THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

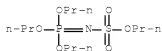
L40 ANSWER 14 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2001:657695 HCAPLUS Full-text
DOCUMENT NUMBER: 135:229350
TITLE: Secondary nonaqueous electrolyte
batteries
INVENTOR(S): Shiga, Toru; Kawauchi, Shigehiro; Takeichi,
Kensuke
PATENT ASSIGNEE(S): Toyota Central Research and Development
Laboratories, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----		-----	-----	
JP 2001243979	A	20010907	JP 2000-51971	200002 28
PRIORITY APPLN. INFO.:			JP 2000-51971	200002 28

AB The batteries have Li transition metal oxide cathodes, Li intercalating
anodes, and a nonaq. electrolyte solution containing a dissolved Li salt;
where the electrolyte solution contains a trialkoxyphosphazosulfonyl alkoxide
or a mixture containing the alkoxide.
IT 271771-17-6 271771-18-7 271771-19-8
358750-79-5
RL: DEV (Device component use); USES (Uses)
(solvent mixts containing trialkoxyphosphazosulfonyl alkoxide for
electrolytes in secondary lithium batteries)
RN 271771-17-6 HCAPLUS
CN Sulfamic acid, N-(triethoxyphosphinylidene)-, ethyl ester (CA INDEX
NAME)

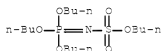


RN 271771-18-7 HCAPLUS
CN Sulfamic acid, N-(tripropoxyphosphinylidene)-, propyl ester (CA
INDEX NAME)



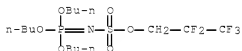
RN 271771-19-8 HCAPLUS

CN Sulfamic acid, N-(tributoxyphosphinylidene)-, butyl ester (CA INDEX NAME)



RN 358750-79-5 HCAPLUS

CN Sulfamic acid, N-(tributoxyphosphinylidene)-, 2,2,3,3,3-pentafluoropropyl ester (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte solvent

trialkoxyposphazosulfonyl alkoxide

IT Battery electrolytes

(solvent mixts containing trialkoxyphosphazosulfonyl alkoxide for electrolytes in secondary lithium batteries)

IT 616-38-6, Dimethyl carbonate 21324-40-3, Lithium

hexafluorophosphate 271771-17-6 271771-18-7

271771-19-8 358750-79-5

RL: DEV (Device component use); USES (Uses)

(solvent mixts containing trialkoxyphosphazosulfonyl alkoxide for electrolytes in secondary lithium batteries)

L40 ANSWER 15 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:397249 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 135:7799

TITLE: Secondary nonaqueous electrolyte batteries, deterioration inhibitors for the batteries, and additives for the battery electrolyte

INVENTOR(S): Otsuki, Masashi; Endo, Shigeki; Ogino, Takao

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 44 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001039314	A1	20010531	WO 2000-JP8041	20001115
W: KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
JP 2001217001	A	20010810	JP 2000-126568	20000426
JP 2001217002	A	20010810	JP 2000-126569	20000426
JP 2001217003	A	20010810	JP 2000-126570	20000426
JP 2001217004	A	20010810	JP 2000-126571	20000426
EP 1253662	A1	20021030	EP 2000-976252	20001115
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
US 6955867	B1	20051018	US 2002-130069	20020515
KR 775566	B1	20071109	KR 2002-706644	20020524
PRIORITY APPLN. INFO.:			JP 1999-334953	A 19991125
			JP 1999-334954	A 19991125
			JP 1999-334955	A 19991125
			JP 1999-334956	A 19991125
			JP 2000-126568	A 20000426
			JP 2000-126569	A 20000426
			JP 2000-126570	A 200004

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JP 2000-126571

A

200004

26

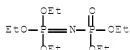
WO 2000-JP8041

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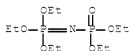
200011

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- AB The batteries use a nonaq. electrolyte solution containing 2-20 volume% phosphazene derivs. and a supporting electrolyte. The supporting electrolyte is preferably LiPF₆. The deterioration inhibitors and the electrolyte additives are the phosphazene derivs. The batteries are preferably secondary Li batteries.
- IT 2397-48-0 2397-48-0D, fluorinated
 RL: MOA (Modifier or additive use); USES (Uses)
 (deterioration preventing phosphazene derivs. in electrolytes for secondary lithium batteries)
- RN 2397-48-0 HCAPLUS
- CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



- RN 2397-48-0 HCAPLUS
- CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
 (CA INDEX NAME)



- IC ICM H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST secondary lithium battery deterioration inhibitor
 phosphazene deriv
- IT Battery electrolytes
 (electrolytes containing phosphazene derivs. for deterioration prevention in secondary lithium batteries)
- IT Secondary batteries
 (lithium; deterioration preventing phosphazene derivs. in electrolytes for secondary lithium batteries)
- IT 2397-48-0 2397-48-0D, fluorinated
 RL: MOA (Modifier or additive use); USES (Uses)
 (deterioration preventing phosphazene derivs. in electrolytes for secondary lithium batteries)
- IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
 105-58-8, Diethyl carbonate 14283-07-9, Lithium fluoroborate

21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(electrolytes containing phosphazene derivs. for deterioration prevention in secondary lithium batteries)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 16 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:369718 HCAPLUS Full-text

DOCUMENT NUMBER: 134:367047

TITLE: Preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes

INVENTOR(S): Tsuchiya, Tsubasa; Kawakabe, Hiroshi; Wakui, Atsushi; Kamata, Tomohisa

PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001139584	A	20010522	JP 1999-325440	19991116
PRIORITY APPLN. INFO.:				19991116

OTHER SOURCE(S): CASREACT 134:367047; MARPAT 134:367047

AB Title compds. (R1O)3P:NSO3R1 or (R2O)3P:NSO2N:P(OR2)3 [R1, R2 = (ether-containing) C1-10 alkyl, haloalkyl] are prepared by reaction of PX5 (X = halo) with sulfamic acid or sulfamide followed by ROM (R = same as R1 or R2; M = alkali metal). PC15 was treated with sulfamic acid in PhCl at 100-105° for 12 h to give 68.8% Cl3P:NSO2Cl, which was treated with diethylene glycol monomethyl ether alcoholate in THF at -22 to -20° for 1 day to give 75.2% (MeOC2H4OC2H4O)3P:NSO3C2H4OC2H4OMe.

IT 14259-65-5P, Bis(trichlorophosphazeno) sulfone

14700-21-1P, Trichlorophosphazosulfonyl chloride

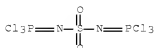
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);

RACT (Reactant or reagent)

(preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)

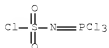
RN 14259-65-5 HCAPLUS

CN Sulfamide, N,N'-bis(trichlorophosphoranylidene)- (CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



IT 72250-12-5P 271771-13-2P 271771-14-3P

271771-15-4P

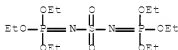
RL: SPN (Synthetic preparation); TEM (Technical or engineered

material use); PREP (Preparation); USES (Uses)

(preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)

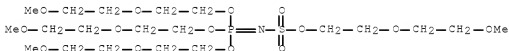
RN 72250-12-5 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexaethyl ester (9CI) (CA INDEX NAME)



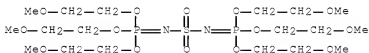
RN 271771-13-2 HCAPLUS

CN Sulfamic acid, N-[tris[2-(2-methoxyethoxy)ethoxy]phosphinyldene]-, 2-(2-methoxyethoxy)ethyl ester (CA INDEX NAME)



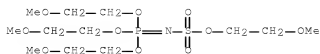
RN 271771-14-3 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-methoxyethyl) ester (9CI) (CA INDEX NAME)



RN 271771-15-4 HCAPLUS

CN Sulfamic acid, N-[tris(2-methoxyethoxy)phosphinyldene]-, 2-methoxyethyl ester (CA INDEX NAME)



- IC ICM C07F009-24
ICS C09K021-12
CC 29-7 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 52
ST sulfonfyl phosphazene prepn flame retardant electrolyte;
battery electrolyte flame retardant phosphazene prepn;
sulfamic acid reaction phosphorus pentahalide alcoholate; sulfamide
reaction phosphorus pentahalide alcoholate
IT Battery electrolytes
Fireproofing agents
(preparation of sulfonfyl-containing phosphazenes as flame retardants for
battery electrolytes)
IT Metal alkoxides
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of sulfonfyl-containing phosphazenes as flame retardants for
battery electrolytes)
IT 109-86-4D, Ethylene glycol monomethyl ether, salts 111-77-3D,
Diethylene glycol monomethyl ether, salts 141-52-6, Sodium
ethoxide 5329-14-6, Sulfamic acid 7803-58-9, Sulfamide
10026-13-8, Phosphorus pentachloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of sulfonfyl-containing phosphazenes as flame retardants for
battery electrolytes)
IT 14259-65-5P, Bis(trichlorophosphazo) sulfone
14700-21-1P, Trichlorophosphazosulfonyl chloride
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);
RACT (Reactant or reagent)
(preparation of sulfonfyl-containing phosphazenes as flame retardants for
battery electrolytes)
IT 72250-12-5P 271771-13-2P 271771-14-3P
271771-15-4P
RL: SPN (Synthetic preparation); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(preparation of sulfonfyl-containing phosphazenes as flame retardants for
battery electrolytes)

L40 ANSWER 17 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:101465 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 134:165659

TITLE: Secondary nonaqueous electrolyte
batteries

INVENTOR(S): Otsuki, Masahi; Endo, Shigeki; Ogino, Takao

PATENT ASSIGNEE(S): Bridgestone Corp., Japan

SOURCE: PCT Int. Appl., 53 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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May 24, 2009

10/540,558

114

WO 2001009973	A1	20010208	WO 2000-JP5053	
				200007 28
W: KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2001102088	A	20010413	JP 2000-126566	200004 26
JP 2001217005	A	20010810	JP 2000-128240	200004 27
JP 2001217007	A	20010810	JP 2000-128241	200004 27
JP 2001217006	A	20010810	JP 2000-128242	200004 27
EP 1205997	A1	20020515	EP 2000-949929	200007 28
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY				
PRIORITY APPLN. INFO.:				
			JP 1999-214814	A 199907 29
			JP 1999-334957	A 199911 25
			JP 1999-334958	A 199911 25
			JP 1999-334959	A 199911 25
			JP 2000-126566	A 200004 26
			JP 2000-128240	A 200004 27
			JP 2000-128241	A 200004 27
			JP 2000-128242	A 200004 27
			WO 2000-JP5053	W 200007 28

OTHER SOURCE(S):

MARPAT 134:165659

GI



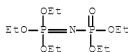
AB The batteries have cathodes, Li intercalating anodes, and a nonaq. electrolyte solution containing Li+ and a phosphazene derivative having flash point $\geq 100^\circ$. Preferably, the phosphazene is I (R1-3 = monovalent substituent or halogen; X = organic group containing C, Si, Ge, Sn, N, P, F, Sb, Bio, O, S, Se, Te, and/or Po; and Y1-3 = single bond, bivalent element or connection group) or (PNR42)_n (R4 = monovalent substituent or halogen, n = 3-15).

IT 2397-48-0 324575-25-9

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(phosphazene derivs. with controlled flash point in electrolyte solns. for secondary lithium batteries)

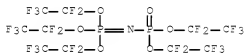
RN 2397-48-0 HCAPLUS

CN Phosphorimidic acid, (diethoxyphosphinyl)-, triethyl ester (9CI)
(CA INDEX NAME)



RN 324575-25-9 HCAPLUS

CN Phosphorimidic acid, [bis(pentafluoroethoxy)phosphinyl]-, tris(pentafluoroethyl) ester (9CI) (CA INDEX NAME)



IC H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte phosphazene flash point

IT Battery electrolytes

(compsn. of electrolyte solns. containing phosphazene derivs. with controlled flash point for secondary lithium batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate

105-58-8, Diethyl carbonate 14283-07-9, Lithium fluoroborate

21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(compsn. of electrolyte solns. containing phosphazene derivs. with

May 24, 2009

10/540,558

116

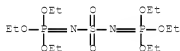
controlled flash point for secondary lithium batteries)
 IT 2397-48-0 324575-25-9
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (phosphazene derivs. with controlled flash point in
 electrolyte solns. for secondary lithium
 batteries)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

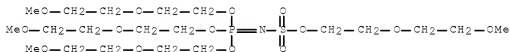
L40 ANSWER 18 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2000:384652 HCAPLUS Full-text
 DOCUMENT NUMBER: 133:20103
 TITLE: Secondary nonaqueous electrolyte
 batteries
 INVENTOR(S): Tsutiya, Hiromu; Kawakabe, Hiroshi; Wakui,
 Atsushi; Kamata, Tomohisa; Sam, Huy
 PATENT ASSIGNEE(S): Nippon Chemical Industrial Co., Ltd., Japan;
 Sony Corporation
 SOURCE: PCT Int. Appl., 31 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000033410	A1	20000608	WO 1999-JP6554	199911 24
W: CA, CN, JP, KR, NO, US RW: DE, FI, FR, GB, SE				
CA 2319384	A1	20000608	CA 1999-2319384	199911 24
EP 1052720	A1	20001115	EP 1999-973181	199911 24
EP 1052720 R: DE, FR, GB, SE, FI	B1	20080312		
CN 1143406	C	20040324	CN 1999-802470	199911 24
TW 437113	B	20010528	TW 1999-88120854	199911 30
US 6475679	B1	20021105	US 2000-601263	200009 05
PRIORITY APPLN. INFO.:			JP 1998-338346	A 199811 30
			WO 1999-JP6554	W 199911 24

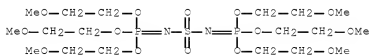
- AB The batteries have a cathode, a Li⁺ intercalating anode, and a nonaq. Li⁺ electrolyte solution containing phosphazene derivs. (RO)3P:NSO3R' (R and R' are monovalent org groups) and/or (RO)3P:NSO2N:P(OR')3. R and R' are preferably C1-10 alkyl group, which may contain ether group or halogen substituents.
- IT 72250-12-5 271771-13-2 271771-14-3
 271771-15-4 271771-16-5 271771-17-6
 271771-18-7 271771-19-8 271771-20-1
 271771-21-2 271771-22-3 271771-23-4
 271771-24-5 271771-25-6 271771-26-7
 271771-27-8
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte solns. containing phosphazene derivs. for
 secondary lithium batteries)
- RN 72250-12-5 HCAPLUS
- CN Phosphorimidic acid, sulfonylbis-, hexaethyl ester (9CI) (CA INDEX NAME)



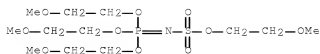
- RN 271771-13-2 HCAPLUS
- CN Sulfamic acid, N-[tris[2-(2-methoxyethoxy)ethoxy]phosphinylidene]-, 2-(2-methoxyethoxy)ethyl ester (CA INDEX NAME)



- RN 271771-14-3 HCAPLUS
- CN Phosphorimidic acid, sulfonylbis-, hexakis(2-methoxyethyl) ester (9CI) (CA INDEX NAME)

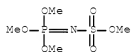


- RN 271771-15-4 HCAPLUS
- CN Sulfamic acid, N-[tris(2-methoxyethoxy)phosphinylidene]-, 2-methoxyethyl ester (CA INDEX NAME)



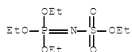
RN 271771-16-5 HCAPLUS

CN Sulfamic acid, N-(trimethoxyphosphinyldene)-, methyl ester (CA INDEX NAME)



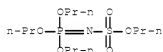
RN 271771-17-6 HCAPLUS

CN Sulfamic acid, N-(triethoxyphosphinyldene)-, ethyl ester (CA INDEX NAME)



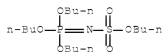
RN 271771-18-7 HCAPLUS

CN Sulfamic acid, N-(tripropoxyphosphinyldene)-, propyl ester (CA INDEX NAME)



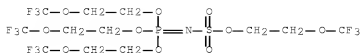
RN 271771-19-8 HCAPLUS

CN Sulfamic acid, N-(tributoxyphosphinyldene)-, butyl ester (CA INDEX NAME)



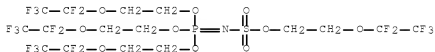
RN 271771-20-1 HCAPLUS

CN Sulfamic acid, N-[tris[2-(trifluoromethoxy)ethoxy]phosphinyldene]-, 2-(trifluoromethoxy)ethyl ester (CA INDEX NAME)



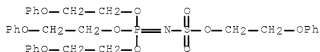
RN 271771-21-2 HCAPLUS

CN Sulfamic acid, N-[tris[2-(1,1,2,2,2-pentafluoroethoxy)ethoxy]phosphinylidene]-, 2-(1,1,2,2,2-pentafluoroethoxy)ethyl ester (CA INDEX NAME)



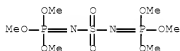
RN 271771-22-3 HCAPLUS

CN Sulfamic acid, N-[tris(2-phenoxyethoxy)phosphinylidene]-, 2-phenoxyethyl ester (CA INDEX NAME)



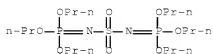
RN 271771-23-4 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexamethyl ester (9CI) (CA INDEX NAME)



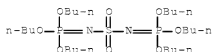
RN 271771-24-5 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexapropyl ester (9CI) (CA INDEX NAME)



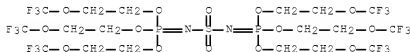
RN 271771-25-6 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexabutyl ester (9CI) (CA INDEX NAME)



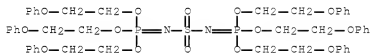
RN 271771-26-7 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis[2-(trifluoromethoxy)ethyl] ester (9CI) (CA INDEX NAME)



RN 271771-27-8 HCAPLUS

CN Phosphorimidic acid, sulfonylbis-, hexakis(2-phenoxyethyl) ester (9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte phosphazene deriv

IT Battery electrolytes

(electrolyte solns. containing phosphazene derivs. for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(electrolyte solns. containing phosphazene derivs. for secondary lithium batteries)

IT 72250-12-5 271771-13-2 271771-14-3

271771-15-4 271771-16-5 271771-17-6

271771-18-7 271771-19-8 271771-20-1

271771-21-2 271771-22-3 271771-23-4

271771-24-5 271771-25-6 271771-26-7

271771-27-8

RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte solns. containing phosphazene derivs. for secondary lithium batteries)

REFERENCE COUNT:

6

THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 19 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2000:67793 HCAPLUS Full-text
 DOCUMENT NUMBER: 132:95813
 TITLE: Secondary lithium batteries
 INVENTOR(S): Shiga, Akira; Aoki, Yoshifumi; Takeichi, Kensuke
 PATENT ASSIGNEE(S): Toyota Central Research and Development
 Laboratories, Inc., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2000030740	A	20000128	JP 1998-200672	199807 15
PRIORITY APPLN. INFO.:			JP 1998-200672	199807 15

AB The batteries use Li intercalating cathodes, graphitic carbonaceous anodes, and a Li salt electrolyte solution; where the electrolyte solution contains 15-50 volume% ethylene carbonate and 0.5-2.5 volume% phosphazene.

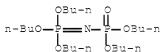
IT 7108-98-7 39528-37-5

RL: DEV (Device component use); USES (Uses)

(electrolyte solns. with controlled ethylene carbonate and phosphazene contents for secondary lithium batteries)

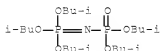
RN 7108-98-7 HCAPLUS

CN Phosphorimidic acid, (dibutoxyphosphinyl)-, tributyl ester (9CI)
 (CA INDEX NAME)



RN 39528-37-5 HCAPLUS

CN Phosphorimidic acid, [bis(2-methylpropoxy)phosphinyl]-, tris(2-methylpropyl) ester (9CI) (CA INDEX NAME)



IC ICM H01M010-40

ICS C07D317-38; C09K021-12

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery electrolyte ethylene carbonate phosphazene
IT Battery electrolytes
(electrolyte solns. with controlled ethylene carbonate and
phosphazene contents for secondary lithium batteries)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 799-83-7
1065-05-0 7108-98-7 21324-40-3, Lithium
hexafluorophosphate 26085-02-9D, Polydichlorophosphazene, reaction
products with sodium ethoxide 39528-37-5
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. with controlled ethylene carbonate
and phosphazene contents for secondary lithium batteries
)

L40 ANSWER 20 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1998:686074 HCAPLUS Full-text

DOCUMENT NUMBER: 130:25419

TITLE: Polyphosphazenes with Novel Architectures:
Influence on Physical Properties and Behavior as
Solid Polymer Electrolytes

AUTHOR(S): Allcock, Harry R.; Sunderland, Nicolas J.;
Ravikiran, Ramakrishna; Nelson, James M.

CORPORATE SOURCE: Department of Chemistry, The Pennsylvania State
University, University Park, PA, 16802, USA

SOURCE: Macromolecules (1998), 31(23), 8026-8035
CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Three types of polyphosphazenes with different architectures have been
synthesized and characterized. The influence of the polymer architecture on
solid ionic conductivity was of particular interest. The first type includes
linear oligo- and polyphosphazenes with the general formula
[N:P(OCH₂CH₂OCH₂CH₂OCH₃)₂]_n (MEEP) with different chain lengths. The second
type consists of a series of tri-armed star-branched polyphosphazenes with the
general formula N(CH₂CH₂NH(CF₃CH₂O))₂P[N:P(OCH₂CH₂OCH₂CH₂OCH₃)₂]_n)₃ with
different arm lengths. These were synthesized via the reaction of the
tridentate initiator [N(CH₂CH₂NH(CF₃CH₂O))₂P:N-PCl₃+}]₃ [PCl₆-]₃ with the
phosphoranimine Cl₃P:NSiMe₃ in CH₂Cl₂ followed by halogen replacement with
sodium (methoxyethoxy)ethoxide. The mol. wts. in this system were carefully
controlled by variation of the monomer-to-initiator ratios, and the effect of
polymer mol. weight on solid ionic conductivity was examined. The third
polymer system was designed to examine the effect of complex branching on
ionic conductivity. Thus, a highly branched polymer containing five branches
from a cyclotriphosphazene pendant side group (with 26 ethyleneoxy units per
repeat unit) was synthesized. The conductivity of this polymer in the
presence of three different salts has been measured and compared to the
behavior of MEEP with a corresponding mol. weight. The mechanism of ion
transport in these systems is discussed.

IT 40678-60-2DP, derivs., lithium complexes
RL: PRP (Properties); SPN (Synthetic preparation); PREP
(Preparation)

(linear and branched; preparation of polyphosphazenes with novel
architecture, their phys. properties, and ionic conductivity of solid
polymer electrolytes prepared by complexation of
polyphosphazenes with lithium)

RN 40678-60-2 HCAPLUS

CN Phosphorimidic trichloride, N-(trimethylsilyl)- (CA INDEX NAME)

Cl3P=N-SiMe3

CC 35-7 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 37, 52, 76

IT Battery electrolytes
 Glass transition temperature
 Ionic conductivity
 Molecular weight
 Polymer electrolytes
 (preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

IT 19278-10-5DP, 2-(2-Methoxyethoxy)ethanol sodium salt, reaction products with poly(dichlorophosphazene), lithium complexes
 26085-02-9DP, Poly(dichlorophosphazene), derivs., lithium complexes
 40678-60-2DP, derivs., lithium complexes
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (linear and branched; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L40 ANSWER 21 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 1998:681962 HCAPLUS Full-text
 DOCUMENT NUMBER: 129:262843
 ORIGINAL REFERENCE NO.: 129:53509a,53512a
 TITLE: High conductivity electrolyte solutions and secondary batteries using the solutions

INVENTOR(S): Angell, Charles Austen; Zhang, Sheng-Shui; Xu, Kang

PATENT ASSIGNEE(S): Arizona Board of Regents, USA

SOURCE: U.S., 14 pp.
 CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5824433	A	19981020	US 1996-748009	19961112
PRIORITY APPLN. INFO.:			US 1996-748009	19961112

OTHER SOURCE(S): MARPAT 129:262843

AB The electrolyte solns. contain an electrolyte solute and a sulfonyl/phospho compound solvent RSO2X (X = halide and R = perfluoroalkyl group, perchlorinated group, N:PX3) or X3P:NR' [R' = P(O)X2 or C1-6 alkyl group]. The solvent may contain Cl3PNSO2Cl, Cl3PNP(O)Cl2, Cl3PNCH3, Cl3PNCH2CH3,

and/or CF₃(CF₂)₃SO₂F; and the electrolyte solute os LiAlCl₄ or (CF₃SO₂)₂NLi.
The electrolyte may also contain a polymer.

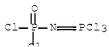
IT 13966-08-0P 14700-21-1P

RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)

(high conductivity electrolyte solns. containing sulfur-phosphorus
compound electrolyte solvents for secondary
batteries)

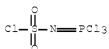
RN 13966-08-0 HCAPLUS

CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
(CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



IC ICM H01M006-14

INCL 429194000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery electrolyte solvent; battery

electrolyte solvent sulfur phosphorous compd

IT Battery electrolytes

(high conductivity electrolyte solns. containing sulfur-phosphorus compound
electrolyte solvents for secondary lithium batteries
and sodium/sulfur batteries)

IT 124-63-0, Methanesulfonyl chloride 9011-14-7, Pmma 14024-11-4,

Aluminum lithium chloride (LiAlCl₄) 90076-65-6

RL: DEV (Device component use); USES (Uses)

(high conductivity electrolyte solns. containing sulfur-phosphorus compound
electrolyte solvents for secondary batteries)

IT 13966-08-0P 14700-21-1P 23453-30-7P

44584-14-7P

RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)

(high conductivity electrolyte solns. containing sulfur-phosphorus
compound electrolyte solvents for secondary
batteries)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

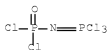
L40 ANSWER 22 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1997:443306 HCAPLUS Full-text

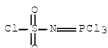
DOCUMENT NUMBER: 127:53454

ORIGINAL REFERENCE NO.: 127:10137a,10140a
 TITLE: Electrochemically stable electrolytes which do not crystallize at ambient temperature
 INVENTOR(S): Angell, Charles Austen; Zhang, Sheng Shui; Xu, Kang
 PATENT ASSIGNEE(S): Arizona Board of Regents, USA
 SOURCE: PCT Int. Appl., 31 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9718159	A1	19970522	WO 1996-US18325	19961113
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
US 5855809	A	19990105	US 1996-748008	19961112
AU 9676807	A	19970605	AU 1996-76807	19961113
PRIORITY APPLN. INFO.:			US 1995-6437P	P 19951113
			US 1996-748008	A 19961112
			WO 1996-US18325	W 19961113
AB	The electrolytes are quasi-salt inorg. ionic liqs. which comprise the reaction product of a strong Lewis acid with an inorg. halide-donating mol., which comprises a substructure selected from NPX ₃ , SO ₂ X, and C(O)X, where X is a halogen. The strong Lewis acid is selected from AlCl ₃ , BCl ₃ , SbCl ₃ , and FeCl ₃ . These quasi-salt inorg. ionic liquid mixts. are useful electrolytes.			
IT	13966-08-00DP, reaction product with aluminum chloride 14700-21-1DP, reaction product with aluminum chloride RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process) (electrochem. stable electrolytes from)			
RN	13966-08-0 HCAPLUS			
CN	Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA INDEX NAME)			



RN 14700-21-1 HCAPLUS
CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



IC ICM C01B021-06
ICS C01B025-10; C01C001-02; H01B001-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST battery electrolyte electrochem stable; halide donating
mol Lewis acid electrolyte
IT Battery electrolytes
(electrochem. stable which do not crystallize at ambient temperature)
IT 75-36-5DP, Acetyl chloride, reaction product with aluminum chloride
13966-08-0DP, reaction product with aluminum chloride
14700-21-1DP, reaction product with aluminum chloride
23453-30-7DP, reaction product with aluminum chloride
44584-14-7DP, reaction product with boron chloride
RL: PEP (Physical, engineering or chemical process); PRP
(Properties); SPN (Synthetic preparation); PREP (Preparation); PROC
(Process)
(electrochem. stable electrolytes from)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L40 ANSWER 23 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 1997:440216 HCAPLUS Full-text
DOCUMENT NUMBER: 127:53456
ORIGINAL REFERENCE NO.: 127:10137a,10140a
TITLE: Sulfonyl/phospho-compound solvent for
high-conductivity electrolyte solutions and
secondary batteries incorporating
these solutions
INVENTOR(S): Angell, Charles Austen; Zhang, Sheng Shui; Xu,
Kang
PATENT ASSIGNEE(S): Arizona State University, Board of Regents, USA
SOURCE: PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9718595

A1

19970522

WO 1996-US18324

199611
13

W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK,
 EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK,
 LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,
 RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN
 RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB,
 GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA,
 GN, ML, MR, NE, SN, TD, TG

AU 9710524

A

19970605

AU 1997-10524

199611
13

PRIORITY APPLN. INFO.:

US 1995-6436P

P

199511
13

WO 1996-US18324

W

199611
13

OTHER SOURCE(S): MARPAT 127:53456

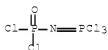
AB The solvent is selected from Cl₃PNSO₂Cl, Cl₃PNP(O)Cl₂, Cl₃PNCH₃, and
 Cl₃PNCH₂CH₃. A sulfonyl/phospho-compound electrolyte solution comprises an
 electrolyte solute and a sulfonyl/phospho-compound electrolyte solvent.

IT 13966-08-0P 14700-21-1P

RL: SPN (Synthetic preparation); PREP (Preparation)
 (solvent for high-conductivity battery electrolyte
 solns.)

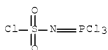
RN 13966-08-0 HCAPLUS

CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
 (CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



IC ICM H01M006-14

ICS H01M006-16; H01M006-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49, 76

ST battery electrolyte solvent sulfonyl phospho compd

IT Battery electrolytes

(sulfonyl/phospho-compound solvent for high-conductivity)
IT 124-63-0, Methyl sulfonyl chloride
RL: DEV (Device component use); USES (Uses)
(solvent for high-conductivity battery electrolyte solns.)
IT 13966-08-0P 14700-21-1P 23453-30-7P
44584-14-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(solvent for high-conductivity battery electrolyte
solns.)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L40 ANSWER 24 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1996:744515 HCAPLUS Full-text

DOCUMENT NUMBER: 126:149660

ORIGINAL REFERENCE NO.: 126:28845a,28848a

TITLE: Room temperature inorganic "quasi-molten salts"
as alkali-metal electrolytes

AUTHOR(S): Xu, K.; Zhang, S.; Angell, C. A.

CORPORATE SOURCE: Dep. Chem., Arizona State Univ., Tempe, AZ,
85287-1604, USA

SOURCE: Journal of the Electrochemical Society (1996),
143(11), 3548-3554
CODEN: JESOA; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

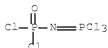
AB Room temperature inorg. liqs. of high ionic conductivity were prepared by
reacting Lewis acid $AlCl_3$ with sulfonyl chlorides. The mechanism is not clear
at this time since a crystal structure study of the 1:1 complex with CH_3SO_2Cl
($T_m = 30^\circ$) is not consistent with a simple chloride transfer to create $AlClO_4^-$
anions. The liquid is in a state somewhere between ionic and mol. A new term
quasi-molten salt is adopted to describe this state. A comparably conducting
liquid can be made using BCl_3 in place of $AlCl_3$. Unlike their organic
counterparts based on ammonium cations (e.g., pyridinium or imidazolium) which
reduce in the presence of alkali metals, this inorg. class of cation shows
great stability against electrochem. reduction (.apprx.-1.0 V vs. Li/Li),
with the useful consequence that reversible lithium and sodium metal
deposition/stripping can be supported. The electrochem. window for these
quasi-salts with $AlCl_3$ ranges up to 5.0 V, and their room temperature
conductivities exceed 10-4 S/cm. They dissolve lithium and sodium
tetrachloroaluminate up to mole fraction .apprx.0.6 at 100° and intermediate
comps. are permanently stable at ambient. The resultant lithium or sodium
salt solns. exhibit electrochem. windows of 4.5-5.0 V vs. Li/Li or Na/Na and
show room temperature conductivities of 10-30 .apprx. 10-25 S/cm. In
preliminary charge/discharge tests, the cell $Li/quasi\text{-}ionic\ liquid$
 $electrolyte/Li_1+xMn_2O_4$ showed a discharge capacity of .apprx.110 mA-h/(g of
cathode) and sustained 80% of the initial capacity after 60 cycles, indicating
that these quasi-molten salt-based electrolytes are promising candidates for
alkali-metal batteries.

IT 13966-08-0P 14700-21-1P,
Trichlorophosphazosulfonyl chloride
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);
PREP (Preparation); RACT (Reactant or reagent)
(reaction with aluminum chloride: electrochem. potential window
and room temperature inorg. quasi-molten salts as alkali-metal
electrolytes)

RN 13966-08-0 HCAPLUS

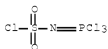
CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)

(CA INDEX NAME)



RN 14700-21-1 HCAPLUS

CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 68, 76

ST room temp inorg quasi molten salt; alkali metal electrolyte quasi molten salt; sulfonyl aluminum chloride melt electrochem window; phosphoryl aluminum chloride melt electrochem window; electrochem potential window sulfonyl phosphoryl chloroaluminate; battery electrolyte inorg quasi molten salt

IT Battery electrolytes

(of sulfonyl chloride or phosphoryl chloride compds. with aluminum chloride)

IT 6041-61-8P 13966-08-0P 14700-21-1P,

Trichlorophosphazosulfonyl chloride

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);

PREP (Preparation); RACT (Reactant or reagent)

(reaction with aluminum chloride: electrochem. potential window and room temperature inorg. quasi-molten salts as alkali-metal electrolytes)

L40 ANSWER 25 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1996:582562 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 125:252809

ORIGINAL REFERENCE NO.: 125:47151a,47154a

TITLE: Inorganic electrolyte solutions and gels for rechargeable lithium batteries

AUTHOR(S): Xu, Kang; Day, Natalie D.; Angell, C. Austen

CORPORATE SOURCE: Dep. Chem., Arizona State Univ., Tempe, AZ, 85287-1604, USA

SOURCE: Journal of the Electrochemical Society (1996), 143(9), L209-L211

CODEN: JESQAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

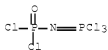
DOCUMENT TYPE: Journal

LANGUAGE: English

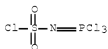
AB A class of inorg. oxychloride compds. have been evaluated for use as electrolytic solvents in rechargeable lithium batteries. Compared with SO₂-based electrolytes, these showed much improved safety while maintaining room temperature conductivities of 10⁻³-10⁻² S/cm and electrochem. voltage windows of 4.5-5.5 V vs. Li⁺/Li and supporting reversible Li metal

deposition/stripping. With the addition of 2-5% polymer, the solns. acquire rubbery character with little loss of conductivity and no change in electrochem. stability. Preliminary charge/discharge tests with intercalation-type cathode as well as sulfur-based cathode showed that these inorg. electrolytes can operate with excellent reversibility.

IT 13966-08-0 14700-21-1, Trichlorophosphazosulfonyl chloride
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(solvent; inorg. electrolyte solns. and gels for rechargeable lithium batteries)
RN 13966-08-0 HCAPLUS
CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI)
(CA INDEX NAME)



RN 14700-21-1 HCAPLUS
CN Sulfamoyl chloride, N-(trichlorophosphoranylidene)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery inorg electrolyte soln gel; safety lithium
battery inorg electrolyte oxychloride
IT Battery electrolytes
(inorg. electrolyte solns. and gels for rechargeable lithium
batteries)
IT Electric conductivity and conduction
(ionic, inorg. electrolyte solns. and gels for rechargeable
lithium batteries)
IT 9011-14-7, Pmma
RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte additive; inorg. electrolyte solns. and gels for
rechargeable lithium batteries)
IT 14024-11-4, Lithium tetrachloroaluminate 90076-65-6
RL: DEV (Device component use); USES (Uses)
(electrolyte; inorg. electrolyte solns. and gels for rechargeable
lithium batteries)
IT 124-63-0, Methane sulfonylchloride 13966-08-0
14700-21-1, Trichlorophosphazosulfonyl chloride
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(solvent; inorg. electrolyte solns. and gels for
rechargeable lithium batteries)

L40 ANSWER 26 OF 26 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 1994:303349 HCAPLUS [Full-text](#)
DOCUMENT NUMBER: 120:303349

ORIGINAL REFERENCE NO.: 120:53329a,53332a
 TITLE: Nonaqueous electrolyte batteries using improved electrolytes
 INVENTOR(S): Kajiwar, Naruyuki; Ogino, Takao; Myazaki, Tadaaki; Kawagoe, Takahiro
 PATENT ASSIGNEE(S): Bridgestone Corp, Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06013108	A	19940121	JP 1993-92204	19930326
JP 3055358	B2	20000626		
JP 11144757	A	19990528	JP 1998-219660	19980717
JP 3055536	B2	20000626		
PRIORITY APPLN. INFO.:			JP 1992-115284	A1 19920409
			JP 1993-92204	A3 19930326

AB In the batteries having cathodes, Li-intercalatable anodes, and Li+-containing nonaq. electrolytes, the electrolytes comprise solns. of phosphazene derivs. having viscosity at 25° of ≤300 cP and dissolving Li salts. The batteries are free from bursting and firing in short circuit, and have high voltage, discharge capacity, etc.

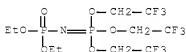
IT 155270-25-0

RL: USES (Uses)

(electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)

RN 155270-25-0 HCAPLUS

CN Phosphorimidic acid, N-(diethoxyphosphinyl)-, tris(2,2,2-trifluoroethyl) ester (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery electrolyte phosphazene deriv safety

IT Safety

(in batteries, electrolytes containing phosphazene derivs. and lithium salts for)

- IT Battery electrolytes
(lithium salts and phosphazene derivs. in, for safety)
- IT Phosphonitrile compounds
RL: USES (Uses)
(phosphazenes, electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- IT 26085-02-9D, Poly[nitrilo(dichlorophosphoranylidene)], reaction products with fluorinated and nonfluorinated propanol 26085-02-9D, Poly[nitrilo(dichlorophosphoranylidene)], reaction products with propanol
RL: USES (Uses)
(cyclic, oligomeric, electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- IT 155270-25-0
RL: USES (Uses)
(electrolytes containing lithium salts and, with limited viscosity, for batteries, for safety)
- IT 7439-93-2D, Lithium, salts 21324-40-3
RL: USES (Uses)
(electrolytes containing phosphazene derivs. and, for batteries, for safety)

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